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# WORK PLAN

## JANUARY 1, 2016 THROUGH SEPTEMBER 30, 2016

### POWER AFRICA TRANSACTIONS AND REFORMS PROGRAM (PATRP)

July 2016

This publication was produced for review by the United States Agency for International Development. It was prepared by Tetra Tech ES, Inc.

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### **DISCLAIMER**

The author's views expressed in this publication do not necessarily reflect the views of the United States Agency for International Development or the United States Government.

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# 1. INTRODUCTION

## 1.1 OVERVIEW

This Work Plan provides an overview of the activities that will be undertaken by PATRP from January 1, 2016 through September 30, 2016. These reflect the priorities of the Power Africa program, and ensure that the PATRP team is fully aligned with the Power Africa Roadmap. The Power Africa Roadmap (the 'Roadmap') describes how the Power Africa initiative intends to meet the objectives of 30,000 MW of new generation, and 60 million new connections by 2030. Importantly, the Roadmap provides a current assessment of what has been achieved and more critically, what remains to be achieved, and how the Power Africa initiative intends to support such achievements. For instance, in the area of new connections, the Roadmap describes what is expected to be achieved through grid expansion and what will be met through Beyond the Grid (BTG) activities.

Given the significant opportunities and attendant challenges that face the energy sector in sub Saharan Africa, the Fiscal Year (FY) 2016 Work Plan documents a significant increase in PATRP's level of assistance. Development of a pipeline of power generation projects from the concept phase up through late-stage transactions, in conjunction with transaction project support to bring late-stage power generation projects to financial closure remains a focal point of PATRP's activities. However, it is also recognized that in most countries, in order to grow the generation sector in a sustainable manner, a holistic approach is needed. Accordingly, PATRP's activities in FY 2016 will expand beyond the legal, commercial and technical assistance to the generation sector. New activities will include turn-around management and loss reduction work within the distribution sector (e.g. Nigeria, Ethiopia, and Liberia), assistance to the gas sector (e.g. Nigeria), expansion of cross-border transmission interconnections (e.g. East Africa Power Pool or EAPP and Organisation pour la Mise en Valeur du fleuve Sénégal or OMVS), and targeted assistance in developing and implementing policy and regulatory frameworks that promote private sector engagement across the sector (e.g. competitive procurement and reverse auction potential in Ethiopia and Tanzania).

Ultimately, PATRP will be looking to remove sector challenges and constraints throughout the energy value chain, thereby enabling power and monies to move through the system - all of which should advance Power Africa's MWs and connections goals.

## 1.2 STRUCTURE OF THE WORK PLAN

PATRP's activities are organized around Country Implementation Plans, which promote a holistic programmatic approach to PATRP's objectives in each country. Further, the activities listed in the Work Plan incorporate the supplemental scope of work agreed with USAID at the end of March 2016, which sees PATRP's footprint extending into new countries, such as Angola, and expanding its existing workstreams and associated resources in others.

Section 1 of this Work Plan summarizes PATRP's activities under Objective 1 (Institutional Support to the Office of the Power Africa Coordinator) of its contract. Sections 2 to 16 present PATRP's activities on a country or regional level, which also incorporate, and promote PATRP's remaining contractual components, or objectives, namely:

- Objective 2: Late-Stage Transaction Support.

- Objective 3: Support for Small-Scale Projects, Mini-Grids, and Rural Electrification.
- Objective 4: Regulatory and Institutional Strengthening and Policy - (a) Electricity Transmission & Distribution (T&D)/Regional Trade, and Institutional Strengthening of Power Pools; (b) Policy and Regulatory Reform; (c) Natural Gas; and, (d) Mobilizing Finance and Building Institutional Capacity.

Further, country and regional level activities are divided into the three core pillars of the Power Africa Roadmap, namely:

- Pillar 1 – Getting to 30,000 MW
- Pillar 2 – Getting to 60 million connections
- Pillar 3 – Unlocking energy sector potential

Country level targets and deliverables presented in this Work Plan are for FY 2016 only.

Sections 17 and 18 discuss in detail PATRP's efforts to comply with the requirements of the Initial Environmental Examination, and the promotion of Gender Integration, respectively.

### **1.3 WORK PLAN MANAGEMENT**

Given the breadth of new activities and expansion of existing activities, it is imperative that there be close cooperation and integration of the different workstreams in each country, and regionally, in some circumstances. PATRP recognizes the importance of coordinating these activities through closer cooperation and management, and is therefore deploying – where possible – Regional and Lead Country Advisors to coordinate activities and facilitate workstream integration creating a seamless country and regional level program.

In addition, PATRP will deploy an additional Deputy Chief of Party (DCOP) to support the program's overall management, and oversee transmission and distribution workstreams, with a focus on providing support across all Country and Regional teams on utility and regulatory performance issues that impact the attractiveness of a power system for investment, harm/delay new connections, or threaten the power sector's financial sustainability due to losses, inadequate tariffs, and poor collection performance. The new DCOP will also ensure that there is close coordination and robust cooperation between the various grid management programs and cross-border work (through EAPP and through the Nile Equatorial Lakes Subsidiary Action Program (NELSAP)) to eliminate overlap and leverage any lessons learned.

### **1.4 SUPPORT TO THE POWER AFRICA COORDINATOR'S OFFICE**

The nature and extent of PATRP support to the Coordinator's Office in both Pretoria and Washington, DC has evolved significantly since the contract was awarded. Some responsibilities undertaken by PATRP early on, such as partner relationship management, have now been mostly absorbed by the Coordinator's Office directly, due to new resources being added. This transfer of responsibility has allowed PATRP to focus on the core activities of advancing transactions and expanding electricity access.

Looking ahead, a number of current activities are expected to continue, with some new resources being added to buttress the provision of these services – as further detailed below:

## **Support for both the Pretoria and Washington DC Offices of the Coordinator**

PATRP's Pretoria team manages and leads program implementation. To this end, the Pretoria team will continue to manage and oversee all PATRP field activities across the continent, provide reporting, ensure quality control, and undertake overall monitoring and evaluation of the program. Another role for Pretoria includes 'technical backstopping' of country or regional teams, including deployment of additional resources to the field when necessary to address barriers to transactions and to provide specialized expertise to support specific transactions.

In terms of institutional support under Objective 1 of the contract, PATRP will continue to provide communications and program management staff embedded within the Coordinator's Office in Pretoria. In addition, PATRP will resource and appoint two new staff members (a Special Assistant to the Coordinator; and a Development Partner Specialist) that will work within the Coordinator's Office. PATRP's Pretoria team will also remain available to provide specialized support to the Coordinator's Office, such as on policy studies or overseeing cross-cutting issues, including gender and environmental reviews.

In Washington, PATRP will continue to focus on supporting the vetting and due diligence of new Power Africa Private Sector Partners, and providing limited IT support for the Customer Relationship Management (CRM) platform that is used by Power Africa Relationship Managers.

### **Cross-cutting Issues**

#### ***Environmental Compliance***

The PATRP Initial Environmental Examination (IEE) acknowledges that PATRP's activities have a potential for indirect negative impacts if not subjected to evaluation and remedial action plans. As such, PATRP activities are evaluated, and remedial action plans are developed, in accordance with directives laid out in the IEE. In accordance with Condition 1 of the IEE, PATRP-supported transactions detailed in Sections 2 to 16 below are subjected to a two-stage screening process in order to determine their risk to the community and the ways in which they may have a social and environmental impact. Section 17 provides details of PATRP's approach to environmental compliance.

#### ***Gender Integration***

PATRP supports the key U.S. foreign policy goal of advancing the full participation of women and girls in the political, economic, and social realms of their countries. It is committed to integrating gender into all of its activities to promote gender equality and women's empowerment. PATRP has developed a gender integration strategy to articulate how it will integrate gender into its scope of work. This strategy was developed in alignment with a broader Power Africa Gender Integration Strategy.

The Power Africa strategy outlines four objectives which guide the development of Power Africa's efforts to integrate gender considerations into its programs and planning. These include:

- Increase women's participation in energy sector policy development and project planning processes;
- Increase consideration of gender issues in design of energy sector policies and projects;
- Increase women's participation in the energy sector work force; and,
- Increase women's access to energy services.

PATRP's gender integration strategy complements Power Africa's Gender Strategy and aims to:

- Institutionalize a gender mainstreaming approach in PATRP;

- Identify gender-related risks and opportunities in transactions and intervene accordingly;
- Leverage opportunities to empower women in small-scale clean energy projects; and,
- Increase women's participation in the energy sector.

Section 18 provides details of PATRP's approach to gender integration.

### **The Power Africa Tracking Tool (PATT)**

Managing and enhancing the PATT remains a priority activity for the PATRP Pretoria team.

To this end, during the period of this Work Plan, PATT versions 1.5 and 2.0 for the Web, iPhone, and Android Applications will continue to be developed and implemented in partnership with USAID's Chief Information Officer.

The web PATT application will allow administrators to easily customize and add more functionality. Such functionality will include flexibility in adding new fields as required, comprehensive user security and dynamic reports with options to export and import to excel.

In order to fully comply with U.S. Government policies and standards (including branding guidelines), the mobile PATT apps will be revised to meet applicable security standards, address best practices and achieve compliance with organizational policies and standards.

We also recognize the importance of maintaining the accuracy and veracity of data contained in PATT. This due diligence will be performed through proactive management and data verification by the Pretoria-based PATRP Project Management Unit, led by the DCOP (Program Management). In parallel, we will continue to refine our data management process through review and assessment of U.S. Government and other 'Proposed' Power Africa transactions that may be viable as 'Active Transactions'. The PATT team will be increased by up to two persons to accommodate additional training required for PATT 2.0, larger data management, including non-PATRP transaction reviews.

PATRP personnel will also support the Coordinator's Office as it looks for ways to share selected information contained in the PATT through the CRM, and with other Power Africa partners, with the goal of furthering energy sector growth. For instance, PATRP is currently working with the Coordinator's Office and the International Renewable Agency (IRENA) to identify ways in which the PATT and IRENAs' Sustainable Energy Marketplace can cooperate.

### **Beyond the Grid (BTG)**

PATRP's BTG workstream will begin to ramp-up during the period of this Work Plan, to include the placement of resident advisors in a majority of the countries and deployment of a new small-scale renewable energy (SSRE) advisor and supporting staff member in Pretoria, South Africa.

Further, it should be noted that while PATRPs BTG activities are set forth in detail under each country or regional portfolio they may, for program management reasons, be budgeted under support to the Power Africa Coordinator's Office (*e.g.* East Africa Regional BTG Advisor, based in Nairobi).

## **Competitive Generation Procurement**

PATRP will explore opportunities in a carefully selected country, which is looking to shift towards competitive procurements for new generation capacity, to develop and help implement a Renewable Energy Auction Toolkit. The Toolkit will ultimately cover the technologies of solar PV, wind, biomass, and small-hydro, and will include: (1) a checklist of necessary enabling environment policy, legal, and regulatory instruments; (2) criteria for choosing the renewable energy technology that is “fit for purpose”; (3) the institutional and mandated leadership arrangements to drive the program; (4) renewable energy auction program design elements that can be easily adapted to suit different jurisdictions; (5) a checklist of key decisions that need to be made before preparing the request for qualifications (RFQ) and request for proposal (RFP); (6) pro forma RFQ and RFP documents (including general requirements, rules and provisions, qualification criteria, evaluation criteria, etc.); and (7) pro forma project agreements for each technology. These efforts are intended to complement and buttress the support PATRP already provides to countries (*e.g.* Ethiopia, Kenya, and Tanzania).

The country will be selected based on agreed criteria, and in close coordination with the Coordinator’s Office. To this end, the development of a checklist and identifying suitable candidate countries will be the focus of activities within FY 2016.

## **Activities no longer supported by PATRP**

PATRP will discontinue the current placement of an advisor within the African Union’s New Partnership for Africa’s Development (NEPAD) following the end of the one-year period in July 2016; however, PATRP will continue to support certain transactions set forth in NEPAD’s Africa Power Vision through its field-based transaction advisors.



## 2. KENYA



### Power Africa Transactions & Reforms Program | Kenya Portfolio 2016

#### KEY TARGETS:

- Generation Capacity Pending Financial Closure; Unit MW **725**
- Transactions Pending Financial Closure; Unit # **9**

#### DELIVERABLES:

- Off-grid strategy and business case developed
- Tariff benchmark study for renewable generation
- Development of specifications and RFPs for prioritized transmission grid interventions to address the system operations gaps

#### PLANNED ACTIVITIES:



#### POWER AFRICA ROADMAP PILLAR I: GETTING TO 30,000 MW

##### **Assistance to large-scale private sector-driven transactions**

PATRP is supporting more than 10 large-scale private sector-driven late-stage transactions with an estimated generation value of nearly 525 MW. Specific late-stage large-scale transactions being supported will include: Kipeto (Wind; 100 MW), Akiira (Geothermal; 70 MW), Kesses 1 (Solar; 40 MW), Rumuruti (Solar; 40 MW), Eldoret I (Solar; 40 MW), Eldoret II (Solar; 40 MW), Menengai (Geothermal; 105 MW), and Mpeketoni (Wind, 90 MW). This activity will be led by the Country Transaction Advisor.

##### **Support the Delivery of Specific KenGen Geothermal Projects**

PATRP will deploy a Senior Geothermal Utility Advisor who will initially focus on completing KenGen's immediate pipeline of projects, namely competitive tenders for three new Olkaria projects totaling 350 MW, as well as the rehabilitation of Olkaria I. Between existing and new projects, PATRP anticipates supporting KenGen with developing generation capacity of 1,300 MW and improving operational efficiency. PATRP will also support KenGen as it works towards its longer-term goal of adding 2,500 MW of new generation capacity by 2025.

##### **Supporting a New Geothermal Development Model through the Geothermal Development Company (GDC)**

Subject to further discussion with USAID, PATRP anticipates continued advice to the GDC in the development of a Joint Development Agreement (JDA) to enable funding for drilling for 645 MW of generation capacity, with an initial 200 MW power plant. To date, this assistance includes support in the drafting of a term sheet, standard form model JDA, and financial model, with input from lenders and geothermal developers that satisfies GDC corporate requirements, Kenyan legal statutes, and market conditions.



## POWER AFRICA ROADMAP PILLAR 2: GETTING TO 60 MILLION CONNECTIONS

### **Integrated Strategy between Government of Kenya's Connection Targets and Private Sector Off-Grid Projects**

PATRP will evaluate off-grid business models with ownership and operational parameters that take into consideration investor needs and incentives, as well as consumer issues, including willingness to pay. This activity will support the development of new generation capacity and connections under the other two activities of the program detailed below. The ultimate target is 900 kW in new generation capacity and a total of 30,000 new connections associated with them. This workstream and the activities under this Pillar 2 will be led by the new Country BTG Advisor.

### **Support to Home-Based Systems (HBS) and Value Chain Companies**

PATRP will support HBS and value chain companies by addressing identified barriers: high up-front costs; kerosene subsidies; lack of clarity regarding electricity grid extension plans; lack of HBS businesses with trained staff operating in rural areas; lack of reliable knowledge about the technology; and capital constraints for HBS businesses. PATRP will address high up-front costs by supporting both value chain companies and end-users with the mapping of sustainable business models for solar decentralized products currently available in Kenya. PATRP will develop a cost benefit analysis with the Rural Electrification Authority (REA) to analyze the impact of the kerosene subsidy removal on the HBS. In addition, PATRP will work with REA to produce a publicly available rural electrification map/region that expresses the plans for grid extension in rural areas. These maps will be shared with developers, financial institutions and consumers to provide clarity on where, when, and which areas will be reached by the national grid. The ultimate target is 2,100 kW in new generation capacity and a total of 70,000 new connections. BTG will also work with the World Bank in supporting the development of a \$100 million loan to off-grid solutions in Kenya, including mini-grid development, acceleration fund and HBS support.



## POWER AFRICA ROADMAP PILLAR 3: UNLOCKING ENERGY SECTOR POTENTIAL

### **Policy Interventions/Capacity building**

PATRP will support the development of a new Renewable Energy Curricula at the Kenya Power Institute of Energy Studies. Scoping of this activity is underway and a more detailed work plan, with deliverables, will be generated.

### **Senior Energy Advisor**

PATRP will also engage a full-time Senior Energy Advisor & Power Africa Liaison (the 'Senior Energy Advisor') who will be responsible for providing high-level policy, legal, regulatory and strategy advice to the Cabinet Secretary for Energy and Petroleum and senior staff in the Ministry. The Senior Energy Advisor will also serve as a link between the Ministry of Energy and Petroleum and Power Africa in order to communicate and coordinate activities that relate to the advancement of the initiative's goals.

### **Develop and Drive a Community Engagement Framework to Support IPPs**

PATRP will initiate a program to support the private sector in developing renewable energy projects that better involve, support, and protect local communities, including women and youth, and that more effectively address social and environmental issues and concerns. To complement this activity, it is also anticipated that PATRP will provide technical support to developers on community engagement.

### **Grid Management Support Program**

This activity builds on previous work to strengthen Kenya's power systems to be ready for the integration of new conventional and renewable generation sources and for sustainable and efficient operation of the National Grid. PATRP will continue to assist Kenya Power, KETRACO, KenGen, and the Energy Regulatory Commission (ERC) to manage system expansion and the integration of renewable energy projects under development as part of the national power grid, and work towards the finalization and adoption of a national grid code consistent with international best practices. The draft Grid Code has been delivered to ERC and should be presented to the ERC Commissioners for their approval, followed by recommendations to the Cabinet Secretary for the start of the gazettelement process.

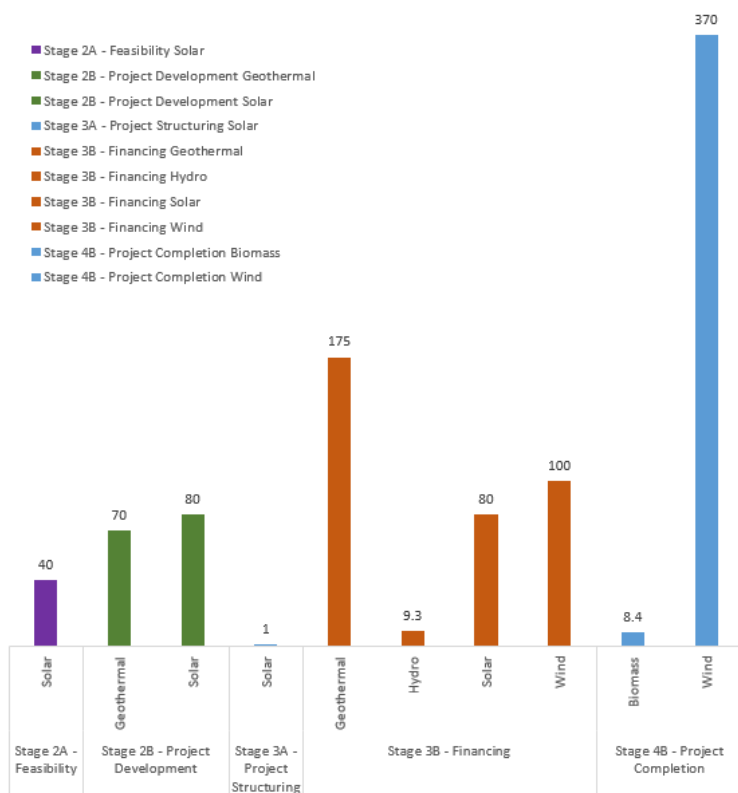
## KENYA | STAFFING & ORGANIZATION

```
graph TD; KCTA["Kenya Country Transaction Advisor  
Chris North  
Tetra Tech"] --- Asst["Assistant  
TBD  
Tetra Tech"]; KCTA --- ACSE["Advisor to Cabinet Secretary, MoE  
TBD  
Tetra Tech"]; KCTA --- STA["Senior Technical Advisor  
David Mwangi  
Tetra Tech (part time)"]; KCTA --- KGA["KenGen Utility Advisor  
Max Walencak  
Nexant"]; KCTA --- LGA["Local Geothermal Advisor  
David Kagiri  
Tetra Tech (part time)"]; KCTA --- CDA["Community Development Advisor  
Kevin Doyle  
Tetra Tech (part time)"]; KCTA --- STTAs["STTAs  
Geothermal Modelling etc.  
Kenya Power training Inst."]; KCTA -.->|For work streams in Kenya| STTAs; STTAs -.->|Coordination and information sharing| KKA["Kenya BTG/SSRE Advisor  
Carolina Barreto  
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Pepin Tchouate  
Tetra Tech"]; KKA -.->|Coordination and information sharing| GMSP["GMSP Team  
Ajit Kulkarni  
Nexant"];
```

The organizational chart for Kenya Staffing & Organization is structured as follows:

- Kenya Country Transaction Advisor**  
Chris North  
Tetra Tech
  - Assistant**  
TBD  
Tetra Tech
  - Advisor to Cabinet Secretary, MoE**  
TBD  
Tetra Tech
  - Senior Technical Advisor**  
David Mwangi  
Tetra Tech (part time)
  - KenGen Utility Advisor**  
Max Walencak  
Nexant
  - Local Geothermal Advisor**  
David Kagiri  
Tetra Tech (part time)
  - Community Development Advisor**  
Kevin Doyle  
Tetra Tech (part time)
  - STTAs**  
Geothermal Modelling etc.  
Kenya Power training Inst.
    - For work streams in Kenya
    - Coordination and information sharing with Kenya BTG/SSRE Advisor and East Africa Regional BTG Advisor
  - Kenya BTG/SSRE Advisor**  
Carolina Barreto  
Tetra Tech
    - Coordination and information sharing with STTAs and GMSP Team
  - East Africa Regional BTG Advisor**  
Pepin Tchouate  
Tetra Tech
    - Coordination and information sharing with STTAs
  - GMSP Team**  
Ajit Kulkarni  
Nexant
    - Coordination and information sharing with Kenya BTG/SSRE Advisor

## KENYA | TRANSACTION DASHBOARD | TECHNOLOGY & STAGE



Name	Technology-- Wind, Solar, etc.	MW
Stage 4B - Project Completion		
Baringo	Biomass	8.4
Lake Turkana	Wind	310
Kinangop	Wind	60
Stage 3B - Financing		
Mutunguru Hydro	Hydro	7.8
Tindinyo Hydro	Hydro	1.5
Kipeto	Wind	100
Menengai Geothermal	Geothermal	105
Rumuruti	Solar	40
Akiira--Phase 1	Geothermal	70
Kesses I	Solar	40
Stage 3A - Project Structuring		
Clover Project - Solar microgrids	Solar	1
Stage 2B - Project Development		
Eldoret I	Solar	40
AGIL-Longonot Phase 1	Geothermal	70
Eldoret II Solar	Solar	40
Stage 2A - Feasibility		
Xago Kogelo (MSOF)	Solar	40

# 3. NIGERIA

Power Africa Transactions & Reforms Program | Nigeria Portfolio 2016




## KEY TARGETS:

▪ Increased Access to Electricity (inferred); Unit #	1,121,647
▪ Generation Capacity Pending Financial Closure; Unit MW	5,000
▪ Transactions Pending Financial Closure; Unit #	22
▪ Generation Capacity Reached Financial Closure; Unit MW	1,400
▪ Transactions Reached Financial Closure; Unit #	7
▪ Training and Capacity Building Activities; Unit hours	2,000
▪ Policy; Unit # (drafted)	3
▪ Kilometers of Transmission/Distribution Lines Reached Financial Close; Unit #	263
▪ Wheeling Capacity Increased; Unit MW	600
▪ Substation Capacity Added at Financial Close; Unit MW	150
▪ Number of Transmission Projects to Reach Financial Close; Unit #	2
▪ Aggregate losses for three distribution companies decreased by an average of	7%

## DELIVERABLES:

- Diagnostic assessment and performance baseline established for each of three DISCOs
- Report summarizing diagnostic and field assessments and performance improvement plans for select distribution companies
- Tariff benchmark study for solar PV generation
- Impact of CBN Circular on energy sector
- Report on market assessment report on off-grid systems
- Report on assessment of working capital requirements for solar companies serving households
- Report on barriers to mobile finance for off-grid solutions
- Report on Gas Sector Assessment and recommendations for assistance
- Report outlining strategy for Gas Competitive Bidding Process
- Strategy Paper on Financing Government Transmission Projects
- Report on Electric Power Sector Reform Act

## PLANNED ACTIVITIES:



**POWER AFRICA ROADMAP**  
**PILLAR I: GETTING TO 30,000 MW**

**Assistance to Facilitate Large Power Generation Investments**

PATRP will continue to provide transaction advisory support to 28 generation projects in Nigeria, spread across the project cycle. The total planned installed capacity of these generation projects amounts to 6,413 MW with required financing of US\$ 7,358,800,000. PATRP will redouble its efforts to secure new MW and connections from large-scale power generation by pursuing the following select interrelated workstreams: PATRP will assist Nigeria Bulk Electricity Trading (NBET) as it starts implementing a competitive power procurement mechanism; unlocking gas-to-power by making more fuel available for power generation and assisting in the reduction of associated gas

flaring. PATRP will map the transmission and gas supply bottlenecks to financial close for existing and new transactions as a critical step in moving these transactions forward.

Specific actions to be undertaken during the period of this Work Plan:

- **Gas-fueled IPPs:** PATRP will provide legal and commercial assistance to NBET for a number of large gas projects, including Century (495 MW), Oma (500MW), Yellowstone (350 MW) and Proton (150 MW) with a goal of having Power Purchase Agreements (PPAs) and Put/Call Option Agreements (PCOAs) fully negotiated. PATRP will also work with NBET to obtain approval of the Ministry of Finance and Ministry of Justice for these and other PPAs and PCOAs, thereby positioning as many projects as possible for financial closings by the end of 2016. In addition, PATRP will provide support to NBET in the Qua Iboe (QIPP, 540 MW) transaction to ensure that the PPA and PCOA are concluded in 2016. This will include a concentrated training on Partial Risk Guarantees and PCOAs for the key bodies of the Federal Government of Nigeria (FGN) that will review and/or approve the final QIPP documents. PATRP will also provide direct support on the development and audit of QIPP financial model.
- **Solar IPPs:** PATRP will continue to support NBET with finalizing the forms of solar PPA and PCOA and successfully closing all outstanding terms in these commercial agreements. Once negotiations are finalized, the most advanced 15 solar IPPs are expected to sign the PPA and PCOA and reach financial close by the end of the year. The transactions dashboard below includes a list of the projects that PATRP is actively supporting.
- **Transition to competitive procurement:** PATRP will also advise NBET on the transition from privately negotiated deals to new power generation procurement (to include all technologies) via competitive mechanisms, which are also being supported by Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ). GIZ's renewable energy competitive bidding program will include as standard documents the PPA and PCOA forms prepared by NBET with assistance from PATRP. PATRP will also provide targeted institutional strengthening support for NBET focused on improving the financial liquidity of the organization.
- **Access to Development Credit Authority (DCA) guaranteed facility:** PATRP was heavily involved in structuring a US\$ 90 million credit guarantee facility that the Development Credit Authority (DCA) and GuarantCo provided to Standard Chartered Bank, which then provided a loan to Zenith Bank, a Nigerian local bank, for lending to the power sector. PATRP has continued to support this transaction by assisting Zenith Bank in its pipeline development and helping generation companies (GENCOs) and Distribution companies (DISCOs) to access the facility.
- **Unlocking gas to power:** PATRP will deploy a new Gas Transaction Advisor to focus on fuel availability for power generation, assisting in the reduction of associated gas flaring, and facilitating in unlocking existing gas to power capacity, including previously privatized GENCOs, Nigeria Integrated Power Projects, and Gas projects in NBET's pipeline. These activities will be incorporated into a detailed work plan that will be developed during FY 2016 by the Gas Transaction Advisor in conjunction with strategic gas advisors retained by PATRP.



## POWER AFRICA ROADMAP PILLAR 2: GETTING TO 60 MILLION CONNECTIONS

### **Pico Solar and Home System (SHS) Companies**

PATRP will carry out an assessment of the main market barriers that pico solar and home system companies operating in Nigeria are currently facing, as well as the incentives other successful off-grid solar PV developers, particularly those in East Africa, will require to consider establishing new businesses in Nigeria, through a range of partnerships with local companies, including franchises. These systems typically range from less than 0.1 kW to 0.5 kW. Following this assessment, PATRP will start to provide technical assistance as required. This may include support on the following:

- Market research on the potential demand, willingness to pay, regulatory environment and access to finance for off-grid solar developers in Nigeria
- Business model development
- Technical product quality assessment and testing
- Distribution and retail strategies
- Marketing approaches, including access to mobile money



## POWER AFRICA ROADMAP PILLAR 3: UNLOCKING ENERGY SECTOR POTENTIAL

### **Support to Facilitate Transmission System Investments**

PATRP is currently assisting the Transmission Company of Nigeria (TCN) by providing a full-time transaction advisor. The current work plan consists of the following two related workstreams: (i) PATRP will assist TCN to complete the transmission projects' pipeline, including project prioritization and funding, financial planning and budgets, and institutional arrangements for transmission project concessions, as a means to encourage public and private investment in transmission; and support TCN's role as the transmission services provider for the Transitional Electricity Market; and, (ii) assist with setting up one or more independent regional TSP Business Units or TCN subsidiaries as part of the overall restructuring of TSP. The abovementioned activities have been broken down into the following tasks:

- Facilitate financial close of all ongoing transmission projects
- Develop transmission project pipeline
- Assist with new transmission procurements
- Assistance to facilitate transmission system investments
- Support TCN's role in the Transitional Electricity Market.

### **Capacity Building**

PATRP will develop training sessions for the Ministries of Finance, Justice and Power to help facilitate the understanding on the PCOA in the advancement of solar projects in Nigeria. This training will help expedite the approval process of key project documents. In addition, PATRP is working with NBET to develop a series of trainings for key government advisors/decision makers to build a better understanding of commercial power transactions.



**Support for Distribution Utilities – Loss Reduction**

PATRP will provide assistance to three distribution companies, supported by a team of field management professionals, to help demonstrate loss reduction strategies, as well as other improvements (e.g., customer enumeration, improved revenue management and revenue protection practices, staff training, health and safety), to allow for improved ways of managing the business to be rolled out throughout the target utilities (and to provide a demonstrative effect for other utilities in the country). At the same time, there is a need to determine how best to support the overall Nigerian distribution sector, recognizing that even if three utilities are fully commercialized, the sector will be unable to be sustained financially. In this regard, support at the federal government level is proposed, including two advisors – one focused on distribution reform and commercialization support, and a second providing assistance for the DISCOs for financial support and restructuring. The advisors will support the various distribution companies in areas such as identifying investment priorities and possible financing mechanisms, supporting business plans, and advising on regulatory issues or other power sector reform issues and their implications for distribution. The abovementioned activities have been broken down into the following tasks, which will be replicated for each utility:

- Undertake a screening to identify the recommended DISCO(s) for assistance. This effort will be ‘fast-tracked’ over a period of 2-3 weeks, to identify the objectives for the support effort and attributes of the DISCOs, to target and prioritize the DISCOs for assistance.<sup>1</sup>
- Complete a stakeholder mapping and establish formal relationships with external stakeholders (e.g., Nigerian Electric Regulatory Commission, BPE, unions).
- Complete a diagnostic assessment of each DISCO and its plans, as well as establish a performance baseline.
- Based in part on the diagnostic assessment and understanding gained from day-to-day efforts at the DISCO, design detailed performance improvement plans by functional area and support their implementation.
- Field-based advisory work (e.g., working in the field, not at the DISCO’s HQ). PATRPs field based team will oversee an effort to ensure improved processes and controls are introduced in the field in an effort to strengthen management control throughout the utility. This will continue beyond the period covered by this Work Plan.
- Mobilize two advisors to staff a centralized team focused on distribution with the objective being to provide support to each DISCO as needed to help advance the performance of the distribution sector.

**Policy Assistance**

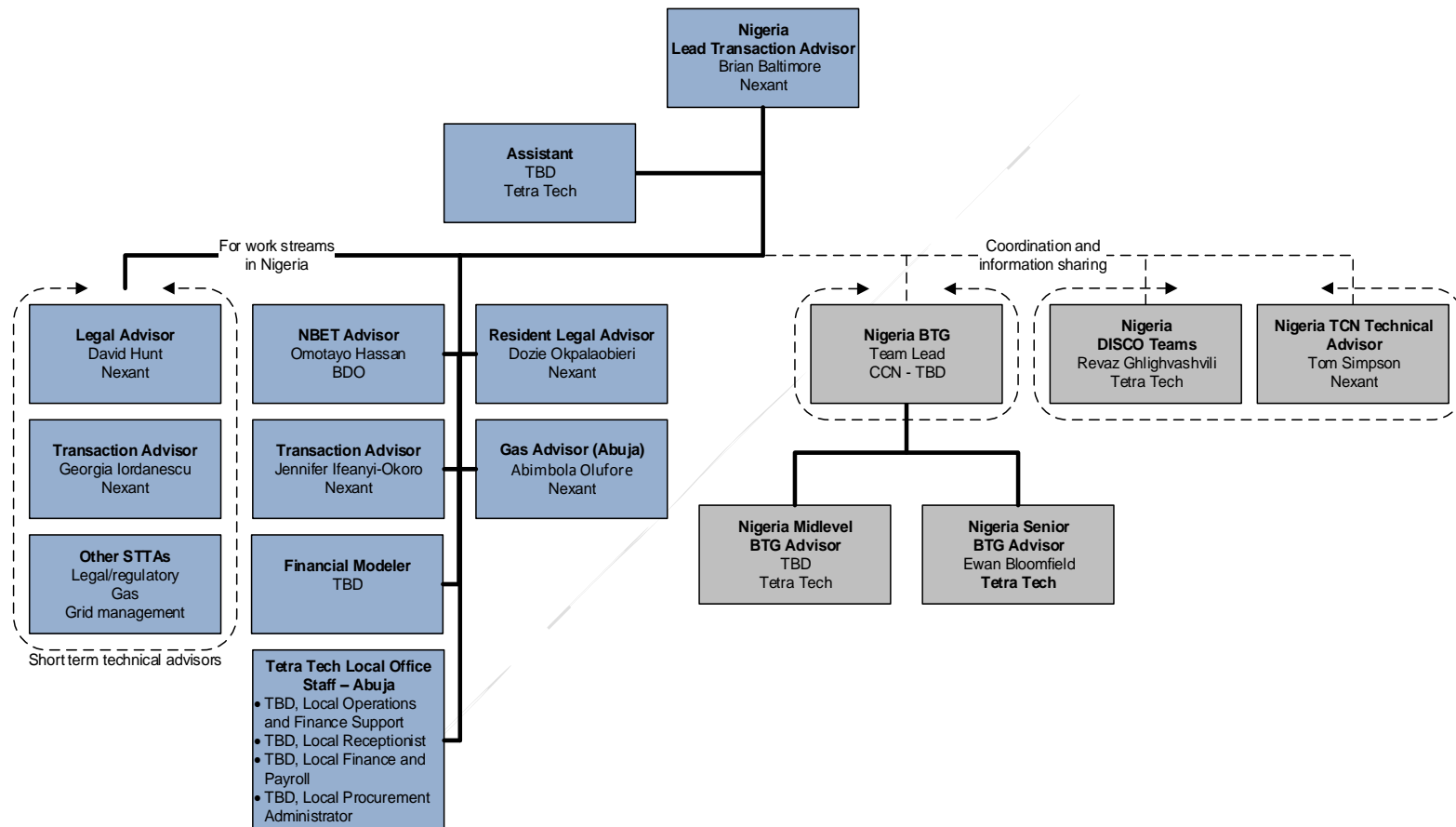
PATRP will complete a report that considers the effect on the Nigerian energy sector of the Circular issued by the Central Bank of Nigeria (CBN) preventing foreign currency lending by local commercial banks to entities that do not enjoy foreign currency revenues. This order has the effect of preventing the operating entities of the Nigerian electricity sector from accessing foreign currency borrowing, as sector revenues from domestic consumers arise in Naira.

PATRP will also generate a tariff benchmark study for solar PV pricing in Nigeria. This will be done in support of the ongoing efforts to finalize negotiations with the most advanced 15 solar IPPs (as mentioned above).

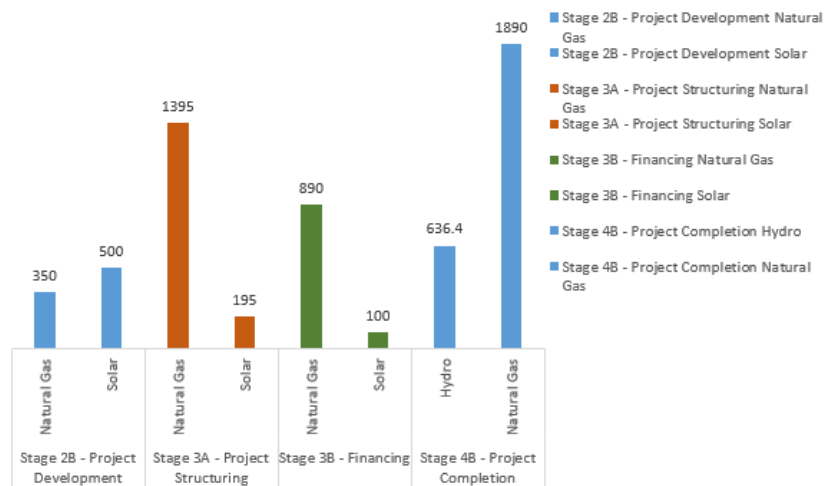
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<sup>1</sup> This has already been completed and three DISCOs selected

## NIGERIA | STAFFING & ORGANIZATION



## NIGERIA | TRANSACTION DASHBOARD | TECHNOLOGY & STAGE



Name	Technology- -Wind, Solar, etc.	MW
Stage 4B - Project Completion		
Kainji Jebba	Hydro	96.4
Kainji Kainji	Hydro	540
Sapele Power	Natural Gas	940
Egbin Power	Natural Gas	220
First Independent Power / Omoka	Natural Gas	25
First Independent Power / Elema	Natural Gas	75
First Independent Power / Afam	Natural Gas	180
Azura / Edo	Natural Gas	450
Stage 3B - Financing		
Qua Iboe (QIPP)	Natural Gas	540
Nigeria Solar Capital	Solar	100
Afam Power	Natural Gas	350
Stage 3A - Project Structuring		
Abiba Solar	Solar	50
Delta Sunrise	Natural Gas	150
Ikot Abasi Power	Natural Gas	250
Century Power	Natural Gas	495
Pan Africa Solar	Solar	75
OMA Power	Natural Gas	500
Panyam Solar	Solar	70
Stage 2B - Project Development		
LR Group--Solar	Solar	100
Motir--Solar	Solar	100
Yellowstone IPP	Natural Gas	350
Rook Solar Investment	Solar	100
Green Cowrie Energy Limited	Solar	100
Nova Solar Power	Solar	100

# 4. GHANA



## Power Africa Transactions & Reforms Program | Ghana Portfolio 2016


### KEY TARGETS:

▪ Generation Capacity Pending Financial Closure; Unit MW	250
▪ Transactions Pending Financial Closure; Unit #	6
▪ Generation Capacity Reached Financial Closure; Unit MW	144
▪ Transactions Reached Financial Closure; Unit #	1
▪ Number of Inferred Connections Reached Financial Close	70,000
▪ Training and Capacity Building Activities; Unit hours	200
▪ Policy; Unit # (drafted)	4

### DELIVERABLES:

- LNG Strategy Paper developed
- Concept study for Takoradi-Tema gas pipeline
- Develop WAGP Reverse Flow Regulations
- Develop energy sector financial model

### PLANNED ACTIVITIES:



**POWER AFRICA ROADMAP**  
**PILLAR I: GETTING TO 30,000 MW**

**Transaction Assistance – Power Projects**

PATRP’s resident Country Transaction Advisor will engage with project developers and stakeholders (e.g., Ministry of Finance (MOF), Ministry of Power (MOP), Ministry of Energy & Petroleum (MOPET), and the Electricity Company of Ghana (ECG)) to facilitate financial close for the following priority thermal IPP projects: Bridge Power (144 MW), Ghana 1000 (now 375 MW) and Aboadze (450 MW). In addition, PATRP will support development of on-grid renewable IPPs, with particular emphasis on (a) providing advice to MOP on execution of a subset of the existing solar PV projects with signed or initialed PPAs, and (b) supporting provision of a DCA guarantee for the ECG Letter of Credit required in the PPA for a 50 MW transaction.

**Support to the Volta River Authority (VRA)**

PATRP will provide assistance to VRA on restoring 1048 MW of thermal power generation (for a net addition of 422 MW of available power) and the use of operation & maintenance (O&M) performance contracts through competitive bidding to ensure adequate long-term VRA thermal plant operation and maintenance. To date, 105 MW has been restored by VRA and the PATRP team will discuss with VRA the terms of further support.



## POWER AFRICA ROADMAP PILLAR 2: GETTING TO 60 MILLION CONNECTIONS

### Off-Grid and Rural Energy

PATRP will advise MOP on the implementation of the new micro-grid policy and the development of guidelines for net metering and rooftop PV; and support the training of Ghanaian individuals in the areas of solar project performance modeling, certification, and monitoring. In this direction, the next six months will see PATRP (a) organize a site visit to communities targeted for mini-grid development in accordance with the MOP's mini-grid policy (issued January, 2016) and consultation between MOP and mini-grid developers on the policy; (b) support MOP in the further articulation and implementation framework for the mini-grid policy; (c) support MOP in the articulation and implementation of a pilot phase of the recently announced net-metering regulation, for rooftop solar projects; and (d) support the Energy Commission (EC) and the Council for Technical and Vocational Education and Training (COTVET) in the development of training materials and processes for certification programs for installers of solar PV rooftop systems and mini-grids. PATRP is also supporting scale-up of successful solar lantern distribution models.



## POWER AFRICA ROADMAP PILLAR 3: UNLOCKING ENERGY SECTOR POTENTIAL

### Transaction Assistance to Ministry of Energy and Petroleum

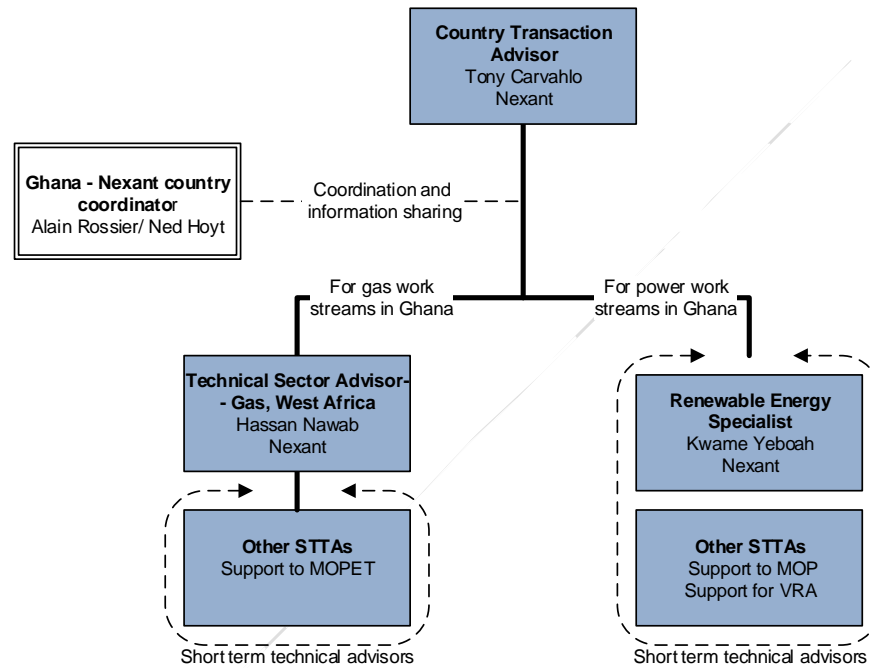
PATRP will continue to support MOPET in the implementation of the Gas Master Plan (approved in June 2016) with the aim of securing gas as the main source of fuel for the expansion of generation capacity. Specific areas of focus will include an LNG strategy paper, a Gas Access Code and Gas Act, an assessment of opportunities for local distribution networks, approval of the Natural Gas Pricing Policy, and a concept study for the Takoradi-Tema gas pipeline. PATRP will also assist with developing the WAGP Reverse Flow regulation, agreement and ensuing implementation, to ensure gas is delivered to existing plants in the Tema area and the Cenpower project. These activities will be led by the resident gas advisor.

### Develop Sector Financial Model to Analyze Financial Flows in the Energy Sector.

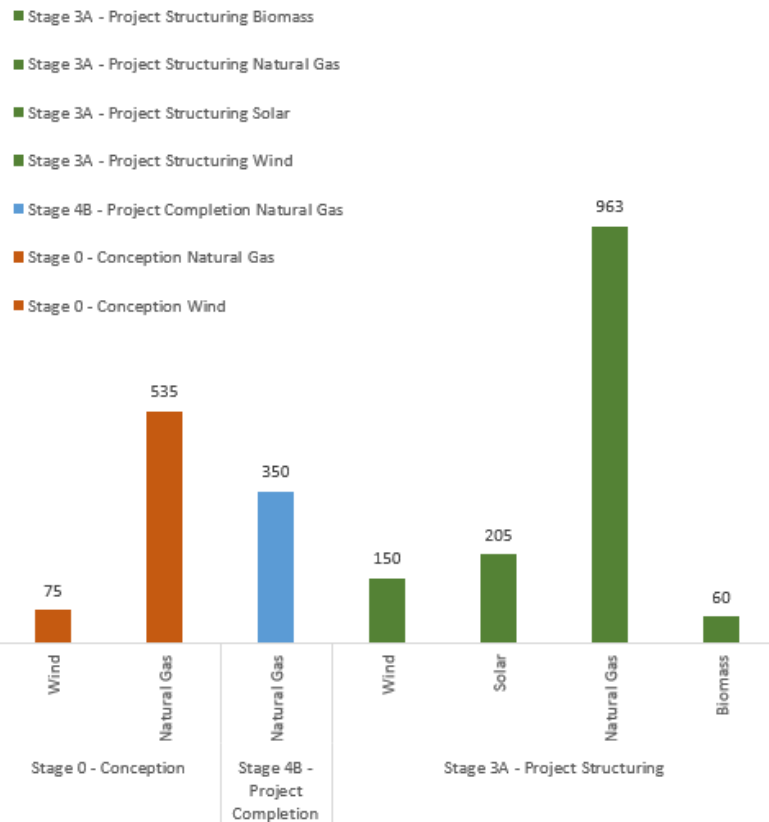
In order to identify strategies for ensuring the financial soundness of the sector, PATRP will perform the following assessments/analysis:

- Securitization of gas projects: creation of a sub-fund within the existing Energy Fund structure and a gas levy to feed the gas fund, with the gas levy being assessed on the wholesale gas price and would create a facility to securitize the purchases of domestic gas and LNG imports;
- Establishment of a Revenue Waterfall System (RWS): the RWS allocates the volatile/scarcely cash generated by the sector among the main entities in the power supply chain, to ensure that sector revenue is fairly distributed, and to reduce the burden on the government's finances;
- Quantification of government subsidies measured by the deficit of the chain each year; and reverse calculation of the electricity tariffs that would reduce the deficit (cost recovery tariff);
- Verification of ECG capacity to pay IPPs and impact on the closure of IPP projects; and,
- Quantification of the financial exposure of Ghana and its evolution over time, opening to solutions to address the country's debt.

## GHANA | STAFFING & ORGANIZATION



## GHANA | TRANSACTION DASHBOARD | TECHNOLOGY & STAGE



Name	Technology-- Wind, Solar, etc.	MW
Stage 4B - Project Completion		
CenPower Kpone	Natural Gas	350
Stage 3A - Project Structuring		
Bridge (Fast) Power Phase 1	Natural Gas	144
Ghana 1000 Phase 1A	Natural Gas	375
Upwind Ayitepa Phase 1	Wind	150
Siginik Energy / CIG--Solar	Solar	50
Mere Power Nzema /Blue Energy	Solar	155
African Plantations for Sustainable Development	Biomass	60
Aboadze	Natural Gas	450
Bridge (Fast) Power Phase 1B & 2	Natural Gas	250
Stage 2B - Project Development		
Kwamoka Biomass Generation Plant	Biomass	6
Stage 0 - Conception		
Ghana 1000 Phase 1B	Natural Gas	375
Upwind Ayitepa Phase 2	Wind	75

# 5. TANZANIA



## Power Africa Transactions & Reforms Program | Tanzania Portfolio 2016


### KEY TARGETS:

▪ Number of New Connections (direct - OFF-GRID); Unit #	300
▪ Generation Capacity Pending Financial Closure; Unit MW	3,050
▪ Transactions Pending Financial Closure; Unit #	7
▪ Training and Capacity Building Activities; Unit hours	500

### DELIVERABLES:

- Solicitation documents for the Task Force (led by Ministry of Energy & Minerals)
- Reverse Auction Procedures for Solar and Wind

### PLANNED ACTIVITIES:



**POWER AFRICA ROADMAP**  
**PILLAR 1: GETTING TO 30,000 MW**

PATRP's Transaction Advisor will continue to advance a number of late-stage transactions through financial close, and also support the development of TANESCO's new competitive generation procurement process. The immediate focus is on the following transactions:

- Masigira HPP (70 MW) – assist TANESCO in negotiating the PPA;
- Kinyerezi III (Stage I: 300 MW; Stage II: 300 MW; 600 MW Total) – assist with drafting PPA;
- Kilwa/Mkaranga II (Stage I: 300 MW) – assist TANESCO in negotiating the PPA; and,
- Malagarasi HPP (hydropower 45 MW) – assist TANESCO on a value for money analytical framework.



**POWER AFRICA ROADMAP**  
**PILLAR 2: GETTING TO 60 MILLION CONNECTIONS**

**Advancing Small-Scale Renewable/Off-grid (Rural Energy Agency – REA)**

REA, in partnership with the World Bank, is in the advanced stages of preparing the proposed Tanzania Rural Electrification Expansion Project (TREET). PATRP's embedded REA Transaction Advisor will assist on the operationalization of the TREET to accelerate project development, and undertake the following:

- Work with developers to identify rural development centers and advance small projects that aggregate sufficient financing demand to make it cost-effective to attract commercial lenders/investors;
- Support the update of outdated feasibility studies, business plans and related documents for priority projects at REA; and,
- Provide capacity building to expand understanding of the appropriate use of commercial law documentation used in forming partnerships appropriate for the Tanzanian context (i.e. Model Joint Venture Agreements).

Transaction-specific activities will include advancing 10-15 of REA's most viable hydropower projects, including Lupali HPP (0.317 MW), Nakatuta HPP (10 MW), Kikuletwa HPP (1.6 MW), Isigula HPP (0.4 MW), Mapembasi (10 MW, 5000 connections), Kiwira HPP (10 MW), and NextGen Solawazi Project (5 MW).



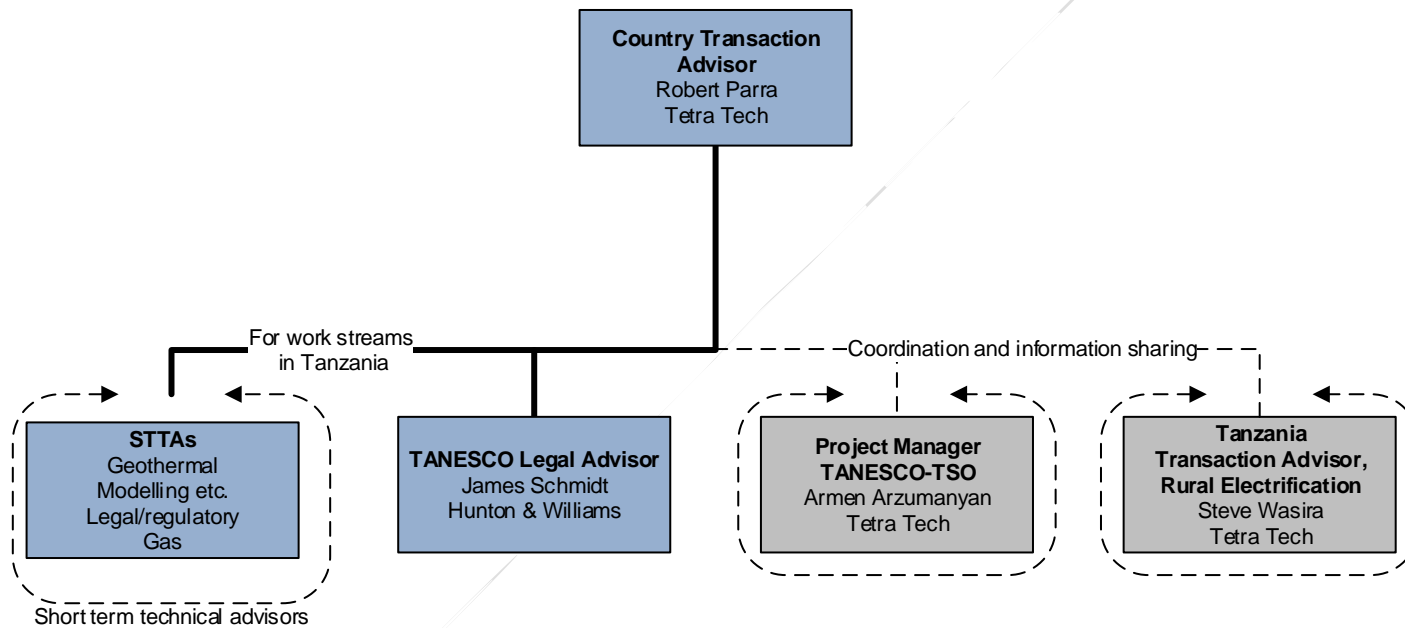


## POWER AFRICA ROADMAP PILLAR 3: UNLOCKING ENERGY SECTOR POTENTIAL

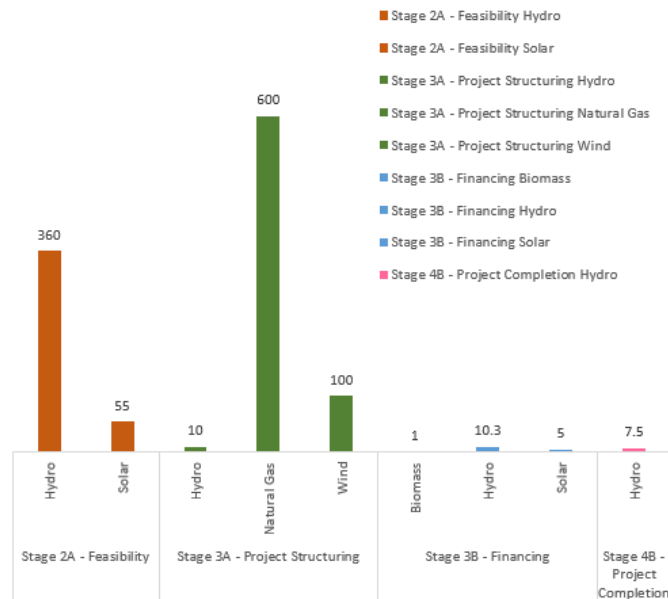
### **Grid Support – TANESCO**

In support of the above referenced activities, PATRP will be working with TANESCO's transmission division through an embedded advisor, with a focus on ensuring that all future generation projects (whether through TANESCO or as an IPP) can be effectively dispatched through adequate grid control operations and investment planning. PATRPs embedded advisor will be ably supported by other short-term technical advisors, who are already assisting with planning and dispatch control activities.

## TANZANIA | STAFFING & ORGANIZATION

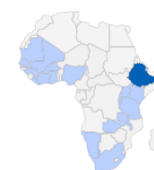


## TANZANIA | TRANSACTION DASHBOARD | TECHNOLOGY & STAGE



Name	Technology-- Wind, Solar, etc.	MW
Stage 4B - Project Completion		
Tulila Hydro	Hydro	7.5
Stage 3B - Financing		
Kiwira River	Hydro	10
Husk Power	Biomass	1
Lupali 317 kW small hydro project	Hydro	0.317
Kigoma	Solar	5
Stage 3A - Project Structuring		
Mapembasi / Njombe	Hydro	10
Kinyerezi III	Natural Gas	600
Singida Wind	Wind	100
Stage 2A - Feasibility		
Ruhudji Hydro	Hydro	360
University of Dodoma	Solar	55

# 6. ETHIOPIA



## Power Africa Transactions & Reforms Program | Ethiopia Portfolio 2016


### KEY TARGETS:

▪ Generation Capacity Pending Financial Closure; Unit MW	4,156
▪ Transactions Pending Financial Closure; Unit #	13
▪ Training and Capacity Building Activities; Unit hours	100
▪ Policy; Unit # (drafted)	2

### Deliverables:

Tariff benchmark study for renewable technologies

### PLANNED ACTIVITIES:



**POWER AFRICA ROADMAP**  
**PILLAR I: GETTING TO 30,000 MW**

**Facilitate Geothermal Power Generation Investments**  
PATRP geothermal activities in Ethiopia will see continued assistance to the two current major geothermal transactions – the 500 MW Corbetti plant and the 500 MW Tulu Moya/Abaya project – as well as to additional early-stage project developments. The PATRP Corbetti team – led by the Senior Transaction Advisor (STA) and Country Transaction Advisor - will provide continued support, with geothermal technical expertise being provided on basis of Short Term Technical Assistance (STTA), with local project finance and legal assistance being provided by new personnel in Addis.

**Competitive Procurement**  
PATRP will continue to provide assistance to the Government in developing and managing competitive procurement processes for IPPs, including expressions of interest (EOIs), Requests for Proposals (RFPs), PPAs and IAs for solar, wind, and hydro projects.

At present, PATRP is supporting separate competitive tenders for (i) the 100 MW Metahara Solar IPP, and (ii) a 290 MW HPP, by providing legal, technical and financial input into the design of the tender to make it attractive to potential developers, the preparation of prequalification criteria and tender documents, and bid evaluation.

It is anticipated that the next six months will also see PATRP support the development of a further 200 MW solar procurement.

**PPP/EPC Procurement of New Generation**  
PATRP will support the Ethiopian Electric Power Corporation (EEP) as it launches procurements of over 1,300 MW for new generation either through public-private partnerships or by using engineering, procurement, and construction (EPC) arrangements. It is anticipated that PATRP's assistance will be largely technical and legal in nature.



## POWER AFRICA ROADMAP PILLAR 2: GETTING TO 60 MILLION CONNECTIONS

### **Develop Options for Structuring and Financing Mini-Grid Projects**

PATRP will provide support to USAID/Ethiopia in reviewing a proposal on how to develop and implement models to integrate private sector investment in and operation of mini-grids, and providing comments to enhance its results. This work will be coordinated with NRECA, who is currently developing a feasibility assessment and business models for mini grids in Ethiopia for USAID.

PATRP will support the development of the approach and implementation of a pilot rooftop solar program at the Ethiopian Electric Utility (EEU) for government-owned condominiums in the Addis Ababa region. BTG will also support companies and entrepreneurs in the HBS and solar value chain in Ethiopia, as needed.



## POWER AFRICA ROADMAP PILLAR 3: UNLOCKING ENERGY SECTOR POTENTIAL

### **Ethiopia Grid Management Support Program (GMSP)**

PATRP is providing several key technical studies essential to ensuring a modern and efficient electricity grid that is prepared for renewables integration. PATRP will continue its assistance to EEP to implement the recommendations of the system operational gap analysis and to develop financing options for the expansion of the transmission and distribution system.

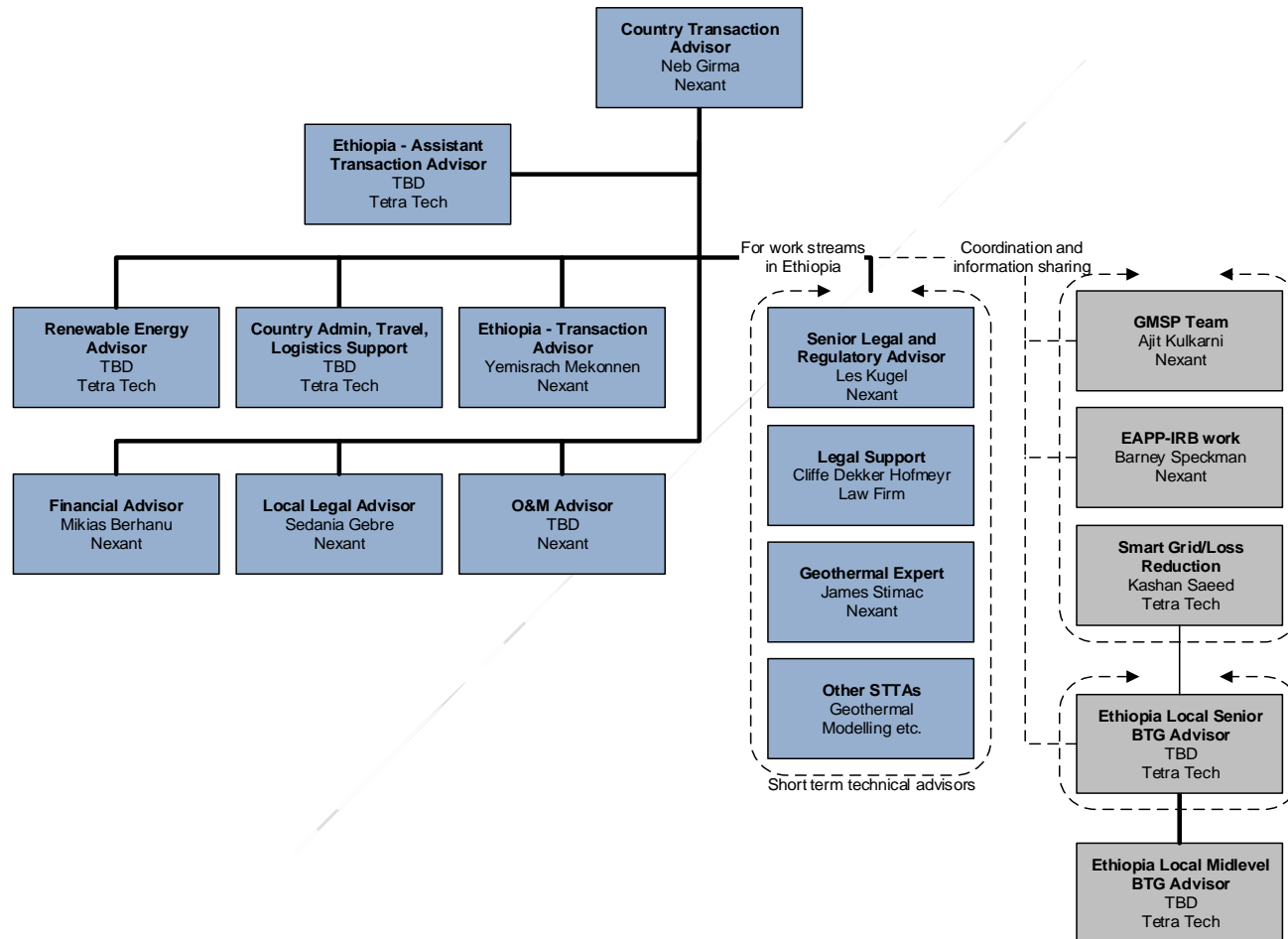
### **Smart Grid Pilot Project/loss reduction**

PATRP will conduct an initial investigation at EEU to assess what steps should be taken to modernize their operations, with a view to introducing greater effectiveness and promoting loss-reduction measures. The investigation will look at EEU's existing systems, and identify appropriate technologies, including IT infrastructure. Based on these findings, a specific work plan will be developed to be approved in FY 2016.

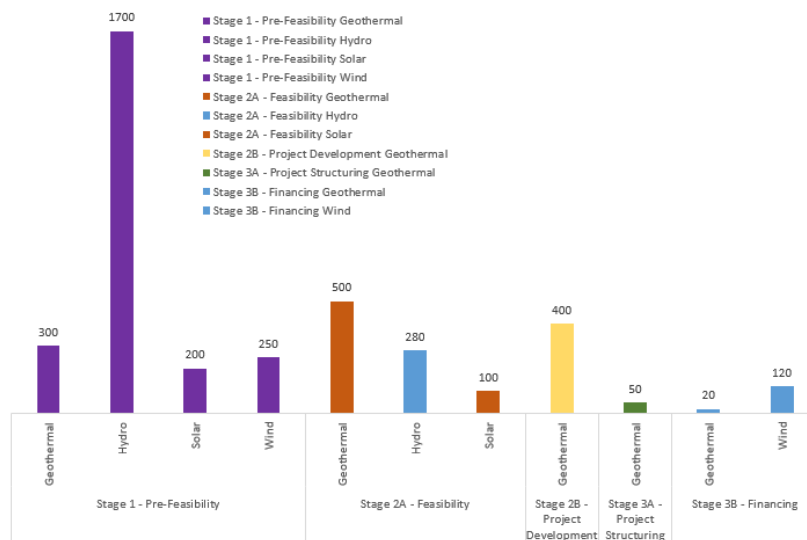
### **Tariff Benchmark Study & legislative support**

A tariff benchmark study for renewable technologies will be completed by a PATRP consultant. PATRP's legal and regulatory team will also support the development of the requisite regulatory framework for solar, wind, biomass, and hydro power IPPs under a renewable energy mandate.

## ETHIOPIA | STAFFING & ORGANIZATION



## ETHIOPIA | TRANSACTION DASHBOARD | TECHNOLOGY & STAGE



Name	Technology-- Wind, Solar, etc.	MW
Stage 3B - Financing		
Corbetti Geothermal Phase 1	Geothermal	20
Aysha Wind Farm	Wind	120
Stage 3A - Project Structuring		
Corbetti Geothermal Phase 2	Geothermal	50
Stage 2B - Project Development		
Corbetti Geothermal Phase 4	Geothermal	200
Corbetti Geothermal Phase 3	Geothermal	200
Stage 2A - Feasibility		
Solar Project 2	Solar	100
Chemoga Yeda 1 & 2	Hydro	280
Abaya & Tulumoya	Geothermal	500
Stage 1 - Pre-Feasibility		
Solar Project 1	Solar	100
Tams Hydro Project	Hydro	1700
Metahara Solar Project	Solar	100
Iteya Wind Project	Wind	150
Geothermal Site 1	Geothermal	300
Debre Birhan Wind Project	Wind	100

# 7. DJIBOUTI

Power Africa Transactions & Reforms Program | Djibouti Portfolio 2016




## KEY TARGETS:

▪ Generation Capacity Pending Financial Closure; Unit MW	110
▪ Transactions Pending Financial Closure; Unit #	2
▪ Training and Capacity Building Activities; Unit hours	100
▪ Policy; Unit # (drafted)	3

## DELIVERABLES:

- Djibouti Integrated Resource Plan
- Draft Electricity Law
- Draft Term Sheets for the following documents: (i) Power Purchase Agreement; (ii) Implementation Agreement; and, (iii) Transmission Connection Agreement


## PLANNED ACTIVITIES:



**POWER AFRICA ROADMAP**  
**PILLAR I: GETTING TO 30,000 MW**

**Transaction Advisory assistance**

The Country Transaction Advisor will continue to advance generation projects by providing transactional support, principally by acting as a facilitator between private sector investors and Government of Djibouti (GoDj) actors, to include the Ministry of Energy and Natural Resources (MERN), and the parastatal power utility, Energie de Djibouti (EDD). New transactions include solar and wind projects totaling 110 MW. The solar IPP transaction is in the late stages of negotiation, with open issues concerning transmission connection. The wind IPP is in the earlier stages of development.



**POWER AFRICA ROADMAP**  
**PILLAR 3: UNLOCKING ENERGY SECTOR POTENTIAL**

**Implementing Regulations under IPP Law**

PATRP will support MERN in implementing Djibouti's IPP law by assisting to: (i) design and develop licensing and concessioning processes, addressing issues such as net metering, land lease processes, and general tariff regimes for power projects sponsored by the Djibouti Ports and Free Zones Authority (DPFZA) and the GoDj; and (ii) develop a strategy for procurement of large-scale IPPs, addressing both unsolicited bids and competitive tendering. Institutional support will also be provided to create the Regulatory Services Department (RSD) and assist MERN to develop other regulations under the IPP law, including other standardized documents required by RSD in its implementation. The requirement for technical assistance for wind and solar procurement (apart from the ongoing transaction support) is embedded in the second task. The wind and solar technical



assistance will be integrated into a Competitive Tender IPP Kit, as well as a Unsolicited Bid IPP Kit, as terms and documents are included specific to these renewable energy resources.

#### **Improvements to the Grid Code**

PATRP will assist in improving Djibouti's grid code, including the rules governing third-party access and use to support the integration of independent power production to the grid currently being developed by EDD. PATRP will assist Djibouti's accession to the governance mechanisms (Grid Code) of the EAPP.

#### **Electricity Law**

PATRP will draft an Electricity Law to accompany the existing IPP Law. The Electricity Law will provide the overarching framework for the power sector, defining the functions to be performed by different power sector entities and the defining the role of the RSD in regulating the electricity sector – in particular the regulation of all activities of EDD. The Electricity Law should address customer-owned generation (including net metering, which is mentioned only in the Energy Efficiency Law but not the IPP Law), off-grid generation, rural electrification, micro-grids, and independent distribution companies (if any). It will define the functions of the System Operator and the Single Buyer. It will also define the requirements for unbundling of EDD activities such as generation, transmission, distribution, and supply, so that the costs of each activity can be identified by the RSD.

#### **Integrated Resource Plan**

An integrated resource plan (IRP) for EDD and MERN will be developed to understand and meet forecasted annual peak and annual energy demand, plus some established reserve margin, through a combination of supply-side and demand-side resources over a specified future period. Steps taken in the creation of the IRP include:

- Forecasting future loads and growth in demand;
- identifying potential resource options to meet those future loads;
- determining the optimal mix of resources based on the goal of minimizing future electric system costs;
- receiving and responding to public participation (where applicable); and,
- creating and finalizing the resource plan.

## DJIBOUTI | STAFFING & ORGANIZATION

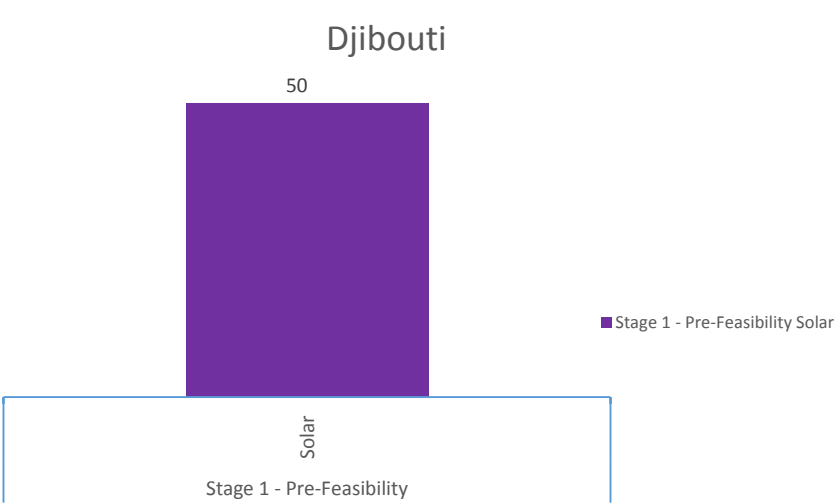
**Country Transaction  
Advisor**  
Rebecca Gaskin  
Nexant

For work streams in Djibouti

**STTAs**  
IPP Enabling Environment

Short term technical advisors

DJIBOUTI | TRANSACTION DASHBOARD | TECHNOLOGY & STAGE



Name	Technology--Wind, Solar, etc.	MW
Stage 1 - Pre-Feasibility		
Grand Bara	Solar	50

# 8. SOUTHERN AFRICA

Power Africa Transactions & Reforms Program | Southern Africa Portfolio 2016




## KEY TARGETS:

- Generation Capacity Pending Financial Closure; Unit MW 300
- Transactions Pending Financial Closure; Unit # 3

## DELIVERABLES:

Strategy developed for South Africa market for Power Africa

## PLANNED ACTIVITIES:



**POWER AFRICA ROADMAP**  
**PILLAR I: GETTING TO 30,000 MW**

**Transaction Advisory Assistance**

Many transactions span several countries, including South Africa, Namibia, and Botswana but are at an early stage in the project cycle and may need support with sourcing funds for feasibility studies, sourcing financing, and negotiating PPAs and other project agreements. In this direction, PATRP has identified a new Transaction Advisor to support the work of the Lead Regional Transaction Advisor.

*Botswana:* Based on a recent trip to Gaborone by the Lead Regional Transaction Advisor, the focus will be on the following activities.

- Follow-up on private, off-grid opportunities identified and determine possible PATRP support with a focus on mining, agribusiness, and new communities.
- Determine the need for and provide support to the Ministry of Minerals, Energy and Water Resources (MMEWR) for its soon to be competitively tendered 2 X 50 MW solar PV deals.
- Determine the need for and possible support to the Botswana Power Corporation (BPC).

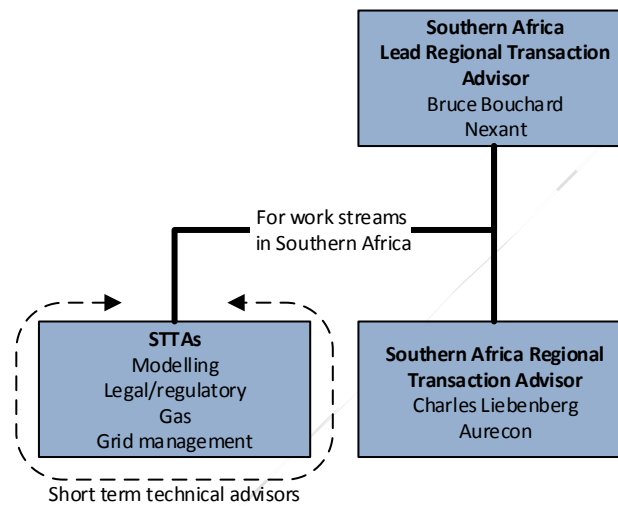
*Lesotho:* Monitor completion of a tender process on a 20 MW solar PV transaction being managed by the Lesotho Electricity Company (LEC) to continue assistance to potential short-listed Power Africa Private Sector Partner.

*Namibia:* At present, PATRP is following about 14 transactions, most of which are in the feasibility stage. We will continue to monitor these deals to determine opportunities for PATRP support. In addition, the state utility (Nampower) has requested a visit by PATRP (which will occur in early July) to determine the potential for support to Nampower, particularly with regard to developing and negotiating PPAs, IAs and related deal documentation. We will also be looking at prospective captive commercial off-taker opportunities with a focus on mining and agribusiness.

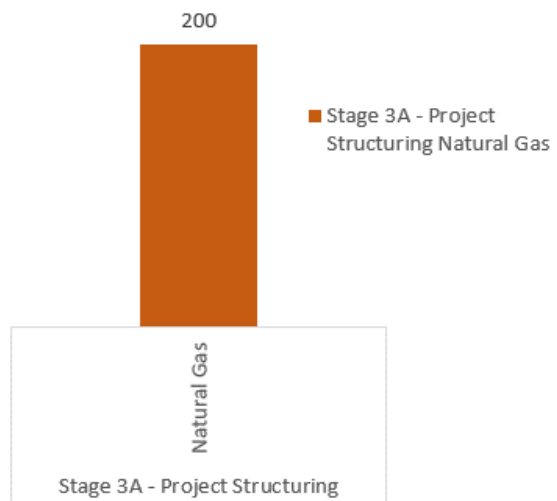
*South Africa:* While seeking to identify and support specific, private IPP transactions, during this period we will also work on developing and beginning to execute a strategy for Power Africa in this market.

*Swaziland:* PATRP is aware of a verbal request from the Government of Swaziland (through the Swaziland Country Team) for Power Africa to provide some support to the Swaziland Electricity Company (SEC) in negotiating transaction agreements with a solar IPP. PATRP will follow up on this and provide transaction advisory assistance, as needed.

## SOUTHERN AFRICA | STAFFING & ORGANIZATION



## SOUTHERN AFRICA | TRANSACTION DASHBOARD | TECHNOLOGY & STAGE



Name	Technology-- Wind, Solar, etc.	MW
Stage 3A - Project Structuring		
Xaris--Gas	Natural Gas	200

# 9. ANGOLA

Power Africa Transactions & Reforms Program | Angola Portfolio 2016




## KEY TARGETS:

- Generation Capacity Pending Financial Closure; Unit MW 0
- Transactions Pending Financial Closure; Unit # 0

## DELIVERABLES:

Begin initial assessment of potential transactions

## PLANNED ACTIVITIES:



**POWER AFRICA ROADMAP**  
**PILLAR I: GETTING TO 30,000 MW**

Subject to USAID/Angola concurrence, PATRP plans to commit a Transaction Advisor on a part-time basis to assist the Ministry of Energy & Water (MINEA) in dealing with IPPs. The effort will provide direct support to MINEA and will act as an independent and neutral counsel to the Ministry in order to accelerate the introduction of IPPs. MINEA has already indicated its interest in such advisory assistance, especially on PPA negotiations and in navigating new IPP opportunities.

To date, MINEA has identified rural electrification projects totaling approximately 1,770 MW and a further eight potential transactions totaling about 1,880 MW (two solar at 30 MW, one natural gas at 500 MW, and five hydro at about 1350 MW). PATRP will begin a cursory review of these transactions to determine whether or not they might merit support.

## ANGOLA | STAFFING & ORGANIZATION

**Angola Transaction  
Advisor**  
TBD  
Tetra Tech/Nexant  
(part time)

For work streams in Angola

**STTAs**  
Modelling  
Legal/regulatory  
Grid management

Short term technical advisors



# 10. MALAWI

Power Africa Transactions & Reforms Program | Malawi portfolio 2016




## KEY TARGETS:

- |  |    |
|--|----|
| ▪ Generation Capacity Pending Financial Closure; Unit MW | 81 |
| ▪ Transactions Pending Financial Closure; Unit #         | 2  |

## DELIVERABLES:

No deliverables due by September 30, 2016

## PLANNED ACTIVITIES:



**POWER AFRICA ROADMAP**  
**PILLAR I: GETTING TO 30,000 MW**

**Technical Assistance to Support Existing and Prospective Projects**

Limited capacity within the Ministry of Natural Resources, Energy and Mining (MNREM) and the Electricity Supply Company of Malawi (ESCOM), will be addressed by embedding a Transaction Advisor within ESCOM and providing short-term technical assistance in support of their recommendations. The immediate focus will be on advancing the following transactions by migrating the existing heads of terms concluded for each into full PPAs (through providing transaction and legal advisory assistance to ESCOM):

- Solar I (30 MW solar PV)
- Solar II (40 MW solar PV)
- Hydro I (4 x 1 MW hydro)

Other areas identified for targeted short-term technical assistance may include: (i) reviewing existing completed feasibility studies on selected hydro projects, proposing updates as may be required, and managing the updating process; and (ii) advising IPPs on where the grid can handle additional generation capacity.

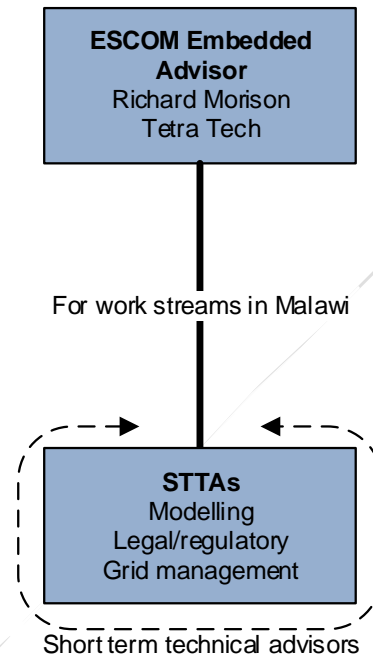


**POWER AFRICA ROADMAP**  
**PILLAR 2: GETTING TO 60 MILLION CONNECTIONS**

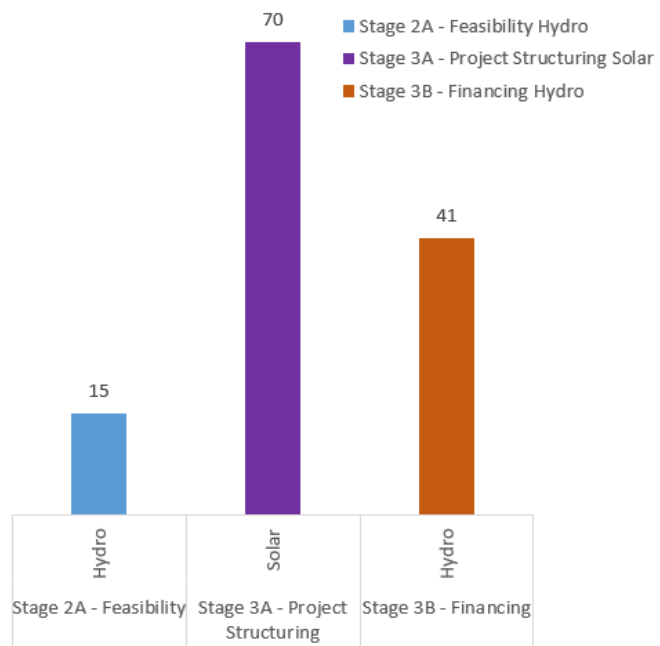
**Off-Grid and Small-Scale Renewables**

PATRP will conduct an off-grid assessment to serve as the basis for the development of a statement of work for USAID/Malawi off-grid activities going forward.

## MALAWI | STAFFING & ORGANIZATION



## MALAWI | TRANSACTION DASHBOARD | TECHNOLOGY & STAGE



Name	Technology-- Wind, Solar, etc.	MW
Stage 3B - Financing		
Mbongozi Power	Hydro	41
Stage 3A - Project Structuring		
Solar I PV	Solar	40
Solar II PV	Solar	30
Stage 2A - Feasibility		
Luweya River	Hydro	15

# 11. ZAMBIA



## Power Africa Transactions & Reforms Program | Zambia Portfolio 2016


### KEY TARGETS:

▪ Generation Capacity Pending Financial Closure; Unit MW	200
▪ Transactions Pending Financial Closure; Unit #	7
▪ Training and Capacity Building Activities; Unit hours	100

### DELIVERABLES:

No deliverables due by September 30, 2016

### PLANNED ACTIVITIES:



**POWER AFRICA ROADMAP**  
**PILLAR I: GETTING TO 30,000 MW**

**Technical Assistance to Support Existing and Prospective Projects**

In terms of support to private sector, Regional Transaction Advisor support from South Africa will facilitate private sector transactions to increase domestic generation in Zambia and work with USAID's part-time transaction advisor. Specifically, PATRP will assist in drafting documents and negotiations as requested on:

- WP 40 MW hydro project
- Kabompo 40 MW hydro
- Kitwe 15 MW solar
- Scaling Solar 200 MW program

**Support for ZESCO to Implement Changes to Promote IPP Projects**

Pursuant to discussions between Power Africa, the Zambian Ministry of Energy and Water Development (MEWD) and ZESCO, Power Africa (through PATRP) will provide technical assistance to ZESCO through the deployment of an embedded Technical Advisor. The Technical Advisor's principal focus will be to facilitate the integration of renewable generation from Independent Power Producers (IPP) onto the national grid, particularly with respect to solar and other intermittent energy sources. The Technical Advisor will also identify opportunities for and guide the deployment of short-term technical assistance to fulfill critical-path needs faced by ZESCO. The Technical Advisor will serve as a critical link between ZESCO and Power Africa in order to communicate and coordinate activities that relate to the advancement of the initiative's goals.



## POWER AFRICA ROADMAP PILLAR 2: GETTING TO 60 MILLION CONNECTIONS

### **Support for Off-Grid Initiatives**

PATRP will provide Regional Transaction Advisor services on an as-needed basis to work on several opportunities to spur additional off-grid MWs by partnering with existing donor and private sector initiatives, such as the Swedish Off-Grid Innovation Fund, which identifies and finances rural power solutions. PATRP will support discussions on how to operationalize the BTG Fund and how to develop a pipeline of projects that could be considered for the fund, as well as support the implementation of existing and planned projects.

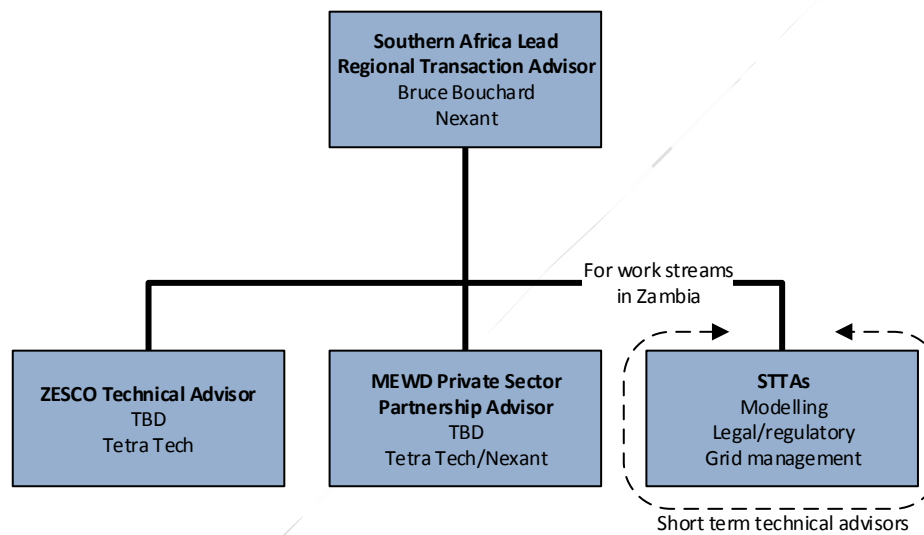


## POWER AFRICA ROADMAP PILLAR 3: UNLOCKING ENERGY SECTOR POTENTIAL

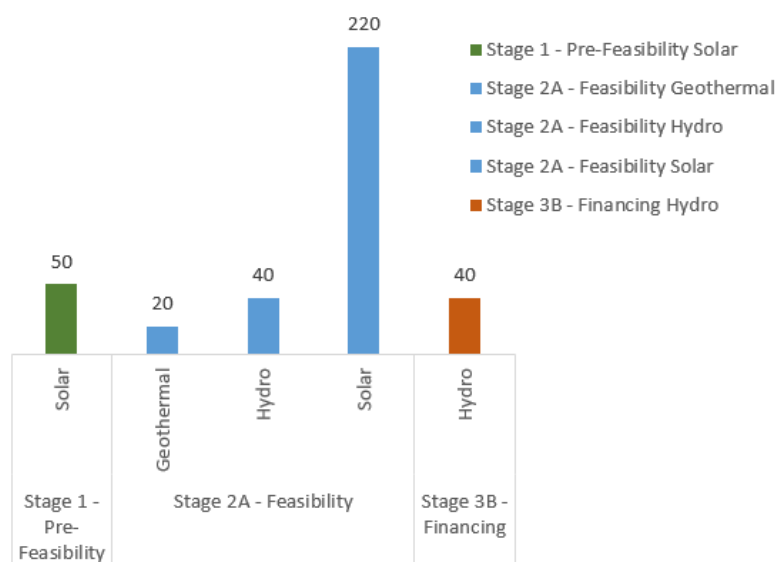
### **Increase the Role of IPPs in Zambia through an Improved Enabling Environment**

Pursuant to discussions between Power Africa and the Zambian Ministry of Energy and Water Development (MEWD), it anticipated that Power Africa (through PATRP) will provide future technical assistance to MEWD through the attachment of an embedded advisor to provide expert analysis and advice on policy, regulatory and procedural issues that impact on prospects for private sector investments in Zambia's renewable energy sector. However, owing to the intervening general election, it is unlikely that this role will be filled in FY 2016.

## ZAMBIA | STAFFING & ORGANIZATION



## ZAMBIA | TRANSACTION DASHBOARD | TECHNOLOGY & STAGE



Name	Technology-- Wind, Solar, etc.	MW
Stage 3B - Financing		
Kabompo	Hydro	40
Stage 2A - Feasibility		
Solar I PV	Solar	10
Solar II PV	Solar	10
Scaling Solar 1	Solar	50
Scaling Solar 2	Solar	50
Kalahari Kafue Project	Geothermal	20
Kumi Kumi Zuba	Solar	100
Ngonye Falls	Hydro	40
Stage 1 - Pre-Feasibility		
Rural Clinic Rooftop Solar	Solar	0
Zambia Solar Power Project	Solar	50

# 12. EAST AFRICA



## Power Africa Transactions & Reforms Program | East Africa Portfolio 2016

### KEY TARGETS:

▪ Generation Capacity Pending Financial Closure; Unit MW	200
▪ Transactions Pending Financial Closure; Unit #	1
▪ Training and Capacity Building Activities; Unit hours	320
▪ Kilometres of transmission lines pending financial close	9,103
▪ Number of Transmission projects pending financial close	7

### DELIVERABLES:

No deliverables due by September 30, 2016


### PLANNED ACTIVITIES:



**POWER AFRICA ROADMAP**  
**PILLAR I: GETTING TO 30,000 MW**

**Additional East Africa Short-Term Advisor**  
Subject to further discussion and concurrence with the USAID East Africa Mission, and the Coordinator's Office, PATRP proposes a part-time East Africa Regional Transaction Advisor that would be deployed on an STTA basis to assist with coordination, track transactions, and backstop mission programs as needed. Given its connectivity to other regional centers, Nairobi provides the most appropriate location.

**Geothermal Activities**  
The high level of geothermal development being promoted and implemented in East Africa, particularly in Kenya, warrants the engagement of a new part-time geothermal advisor based in Nairobi. The advisor will focus on providing technical support (e.g. geo-sciences, reservoir engineering, exploration, and drilling) to mature generation projects (e.g. Menengai) that have already been identified in Kenya, Ethiopia and Djibouti.



**POWER AFRICA ROADMAP**  
**PILLAR 2: GETTING TO 60 MILLION CONNECTIONS**

**Uganda BTG**  
PATRP will be deploying a BTG Transaction Advisor, stationed in Uganda to act as both originator and driver of priority projects in the country. Specifically, the Advisor will (i) review project feasibility and technical designs; (ii) meet with project developers to discuss any issues found and improve bankability of projects; and (iii) meet with financial institutions to discuss project pipeline. The immediate focus will be the following projects - PATRP will review the status of each project to identify potential technical and transaction support:

- Mayuge Sugar Industries (23 MW);
- Nyamabuye HPP (7 MW);
- Nyabahuka-Mujunju project HPP (3.2 MW); and,
- Four small HPP projects: Kakaka (5 MW), Lubilia (5.4 MW), Nyamagasani II (5 MW), Siti I and II (21.5 MW).





## POWER AFRICA ROADMAP

### PILLAR 3: UNLOCKING ENERGY SECTOR POTENTIAL

#### Technical Assistance to EAPP and IRB

PATRP will build on its current technical support to the Eastern Africa Power Pool (EAPP) in realizing the institutional and legal mechanisms necessary for inter-regional power trading, as well as to address technical constraints among the individual transmission systems involved. The specific objectives include: supporting long-term wheeling agreements on the Ethiopia-Kenya-Transmission (EKT) transmission line and tariffs, enhancing compliance with the EAPP Interconnection Code, establishing a bilateral trading platform, and assessing transmission access and pricing, among others.

#### Technical Assistance for the Nile Equatorial Lakes Subsidiary Action Program (NELSAP)

As a complement to, and in conjunction with the advisory work being done with the EAPP and IRB, PATRP will provide technical assistance to NELSAP and other cross-border interconnection projects implemented by national transmission operators. PATRP's technical assistance to NELSAP will be led by the resident PATRP regional technical advisor based in Kigali, and will involve support to the following projects:

- **Northern Corridor Interconnectors:** The Northern Corridor is in the most advanced stage of development, becoming the major axis of power trade between Kenya, Uganda, Rwanda, Burundi, and Western Tanzania.
- **The Rusizi and Rusumo HPP Interconnectors:** With the construction of the two hydropower plants and interconnectors, a complicated mesh of transmission lines will traverse the countries of Democratic Republic of Congo (DRC), Burundi, Rwanda, Uganda, and Tanzania.
- **The Southern Lake Victoria (SLV) Corridor:** The SLV corridor is at an early stage of development into the axis of power trade between southern Uganda, western Tanzania and western Kenya, closing the South Victoria ring from Mbarara, Kigoma, and Mwanza to Lessos in Kenya.

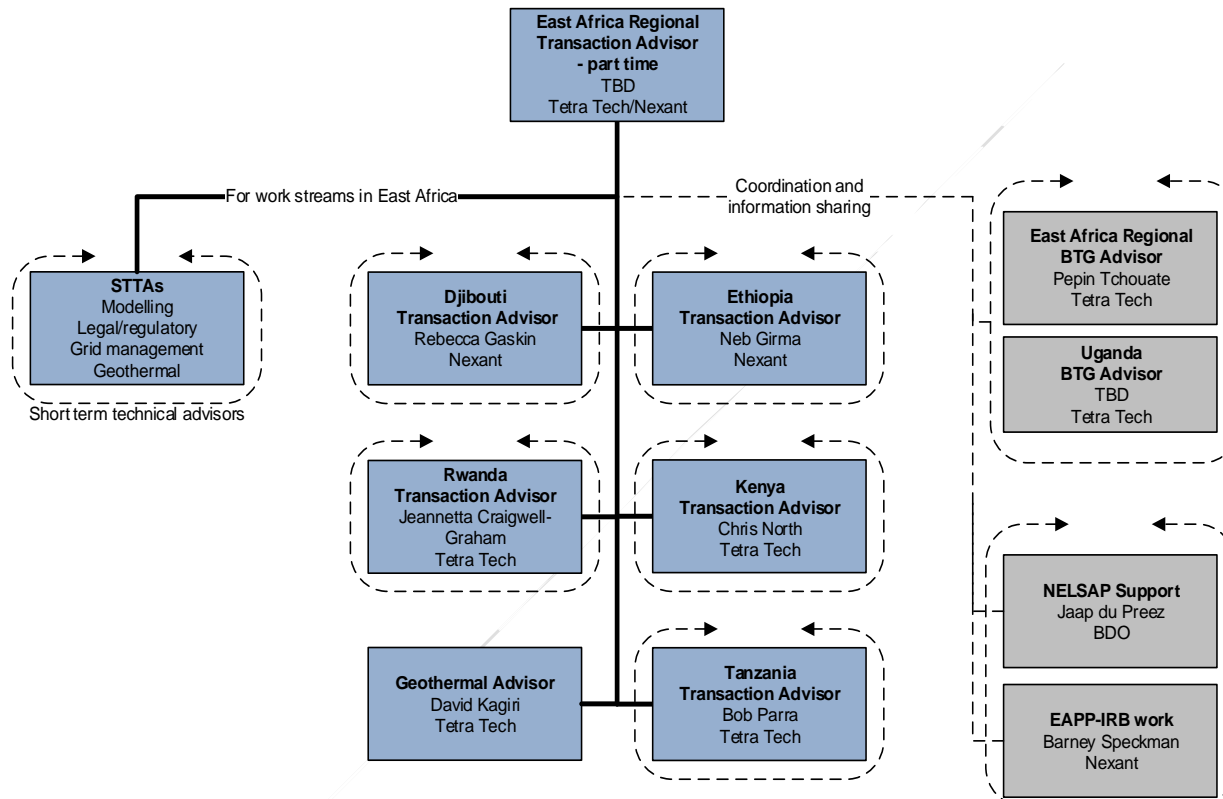
Assistance will include leveraging parallel work being done with EAPP on template power purchase agreements (PPA), wheeling agreements, and tariff studies. The regional technical advisor will also provide support during the procurement of EPC contracts. Through PATRP's assistance to NELSAP, it is expected that at least five additional PPAs / wheeling agreements will be signed between member countries of the NEL region amounting to 400 MW in the next two years.

#### Regional BTG Activities

Recognizing the importance of the East Africa Region in meeting Power Africa's goals on connections in the off-grid space, PATRP will add a BTG Policy and Regulatory Specialist stationed in Nairobi, Kenya, who will provide guidance and support to BTG policy and regulatory activities in East African countries and promote replicability of successful off-grid projects throughout the region. The following activities will be conducted:

- Review and draft recommendations to improve government strategies (laws, regulations, reform) on SSRE projects and private sector involvement.
- Provide analysis and advice on legal and regulatory framework for off-grid energy solutions to utilities, government entities and private sector stakeholders.
- Support capacity building of local project developers on basic commercial practices and standard contract model, policy and regulatory reforms.

## EAST AFRICA | STAFFING & ORGANIZATION



# 13. RWANDA



## Power Africa Transactions & Reforms Program | Rwanda Portfolio 2016


### KEY TARGETS:

▪ Generation Capacity Pending Financial Closure; Unit MW	295
▪ Transactions Pending Financial Closure; Unit #	3
▪ Training and Capacity Building Activities; Unit hours	192
▪ Policy; Unit # (drafted)	3

### DELIVERABLES:

- Complete database of template project agreements
- Standard form regional PPA and wheeling agreement

### PLANNED ACTIVITIES:



**POWER AFRICA ROADMAP**  
**PILLAR I: GETTING TO 30,000 MW**

**Assistance to Facilitate Power Generation Investments**

The estimated current pipeline of IPP projects in Rwanda are as follows:

- The second phase of the 100 MW KivuWatt methane gas project, equivalent to 75 MW (PPA signed, financial close for second phase has not been reached);
- 50 MW methane gas power project (PPA signed, financial close not been reached);
- 80 MW Rusumo Falls hydropower project of which Rwanda has agreed to purchase approximately 26 MW (concession agreement signed, PPA not yet signed);
- 145 MW Ruzizi III hydropower plant of which Rwanda has agreed to purchase 45 MW;
- 80 MW peat power project where PPA (amended PPA and direct agreement signed, financial close not been reached); and,
- Several micro hydro transactions equivalent to approximately 40 MW.

As Rwanda's current installed capacity of approximately 122 MW meets its present demand, and it appears that the Government of Rwanda's policy is leaning towards off-grid solutions in lieu of expansion of the grid, PATRP will analyze whether there is sufficient demand to meet the anticipated generation over the next several years, and begin assistance to the Government of Rwanda on both its generation planning and development of a strategy for offtake of excess supply. In this respect, the Transaction Advisor will work closely with the AGI Advisor that is currently embedded within the Ministry of Energy.



## POWER AFRICA ROADMAP PILLAR 2: GETTING TO 60 MILLION CONNECTIONS

### **Off-Grid and Small-Scale Renewables**

In addition to transaction support for BTG projects, PATRP will begin supporting the Ministry of Energy in the development of off-grid solutions. BTG will provide an embedded advisor to assist in managing the detailed design and implementation of the off-grid program. The BTG advisor would play a liaison role between the government and private sector. BTG will also support the development of policies and frameworks that clearly demarcate future supply areas of the national utility and concessional BTG utilities, with a clear policy on what happens with tariffs and assets when the grid is operational.



## POWER AFRICA ROADMAP PILLAR 3: UNLOCKING ENERGY SECTOR POTENTIAL

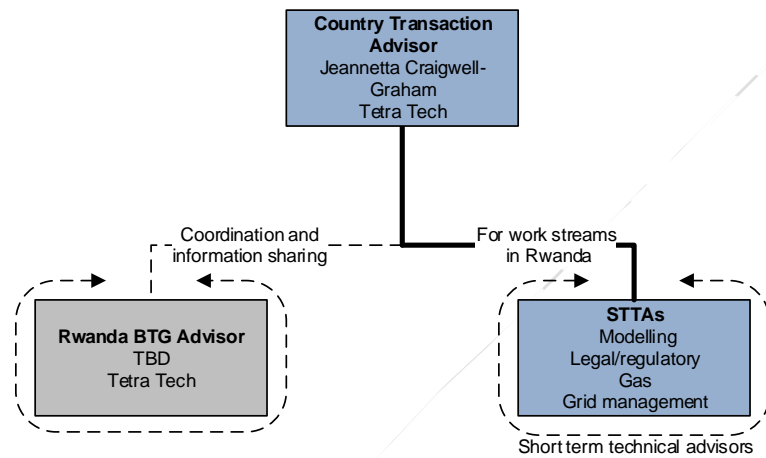
### **Capacity building at the Energy Utility Corporation Limited (EUCL)**

PATRP will begin its assistance to EUCL, which will comprise:

- Assisting EUCL on development of system operational planning and dispatch processes, relevant operating rules and procedures;
- Assisting EUCL in developing a systematic approach and a system and processes investment plan for adequate system operational planning and dispatch; and,
- Providing relevant trainings and capacity building for the planning and operational personnel of EUCL.

As a result of this work, EUCL will be in a better position to meet its' mandate for operational planning and dispatch and prepare for future sector restructuring and system changes

## RWANDA | STAFFING & ORGANIZATION



# 14. WEST AFRICA



## Power Africa Transactions & Reforms Program | West Africa Portfolio 2016


### KEY TARGETS:

▪ Generation Capacity Pending Financial Closure; Unit MW	5,000
▪ Transactions Pending Financial Closure; Unit #	40
▪ Generation Capacity reached Financial Closure; Unit MW	28
▪ Transactions Reached Financial Closure; Unit #	1
▪ Number of Inferred Connections Reached Financial Closure	4,000

### DELIVERABLES:

- Hydropower development action plan for Guinea
- Strategy on regional transmission integration

### PLANNED ACTIVITIES:



**POWER AFRICA ROADMAP**  
**PILLAR I: GETTING TO 30,000 MW**

**Transaction Advisory – Large-Scale**

The Lead Regional Transaction Advisor based in Senegal will continue to provide general transaction support to various Power Africa stakeholders in West Africa’s energy sector. Priority transactions will include:

- Taiba Ndiaye (150 MW – Wind): Senegal;
- Tambacounda (294 MW – Hydro): Guinea;
- Bumbuna II (202 MW – Hydro): Sierra Leone;
- OMVG Transmission line (800 MW): Guinea, Gambia, Guinea Bissau & Senegal; and,
- Gas project (size to be defined – CCGT: Senegal)

In addition, the number of gas projects in West Africa has increased rapidly due to newly found offshore gas reserves. A new Regional Transaction Advisor based in Cote d’Ivoire will provide particular assistance in the development of gas-fired generation projects, including: (i) advice on gas resource development strategies, resource benchmarking, required technical studies, and demand growth assessments; and, (ii) assistance in project development negotiations, tendered and unsolicited procurement methods, and proposal evaluations. The Lead Regional Transaction Advisor will oversee the work of other advisors in the region, to include the new Regional Transaction Advisor (Cote d’Ivoire) and the Transaction Advisor who will be placed at the Africa Development Bank (AfDB) to support the Bank’s Private Sector Department (OPSM) in Cote d’Ivoire.

**Technical Assistance to West Africa Power Pool (WAPP) PPP Advisor in Closing Current Project Pipeline**

PATRP will support the WAPP PPP Advisor in the development of two 450 MW gas-fired power plants that make up the immediate pipeline. PATRP’s regional team will provide technical advice and transaction support on project procurement and IPP negotiations.



## POWER AFRICA ROADMAP PILLAR 2: GETTING TO 60 MILLION CONNECTIONS

### **Beyond the Grid (BTG) Support**

As requested by WA/Regional Mission, PATRP will provide mini-grid strategy support to regional stakeholders such as the Economic Community Of West African States (ECOWAS) Centre for Renewable Energy and Energy Efficiency (ECREEE); support to ECOWAS with the implementation of the efficient lighting strategy, which will start implementation throughout the region in 2016; and support to ECOWAS to promote the private sector role in developing a strong off-grid lighting market, given examples from regions where heavy subsidies and free distribution of solar off-grid lighting products have damaged the market. BTG proposes to work with current stakeholders and offer technical assistance to current programs where needed, while ensuring that there will not be any duplication with the work of any other mission's partners. BTG will also work with East African companies and entrepreneurs to try to bring them and their business models into West African countries. BTG will provide a full time Advisor in the region.

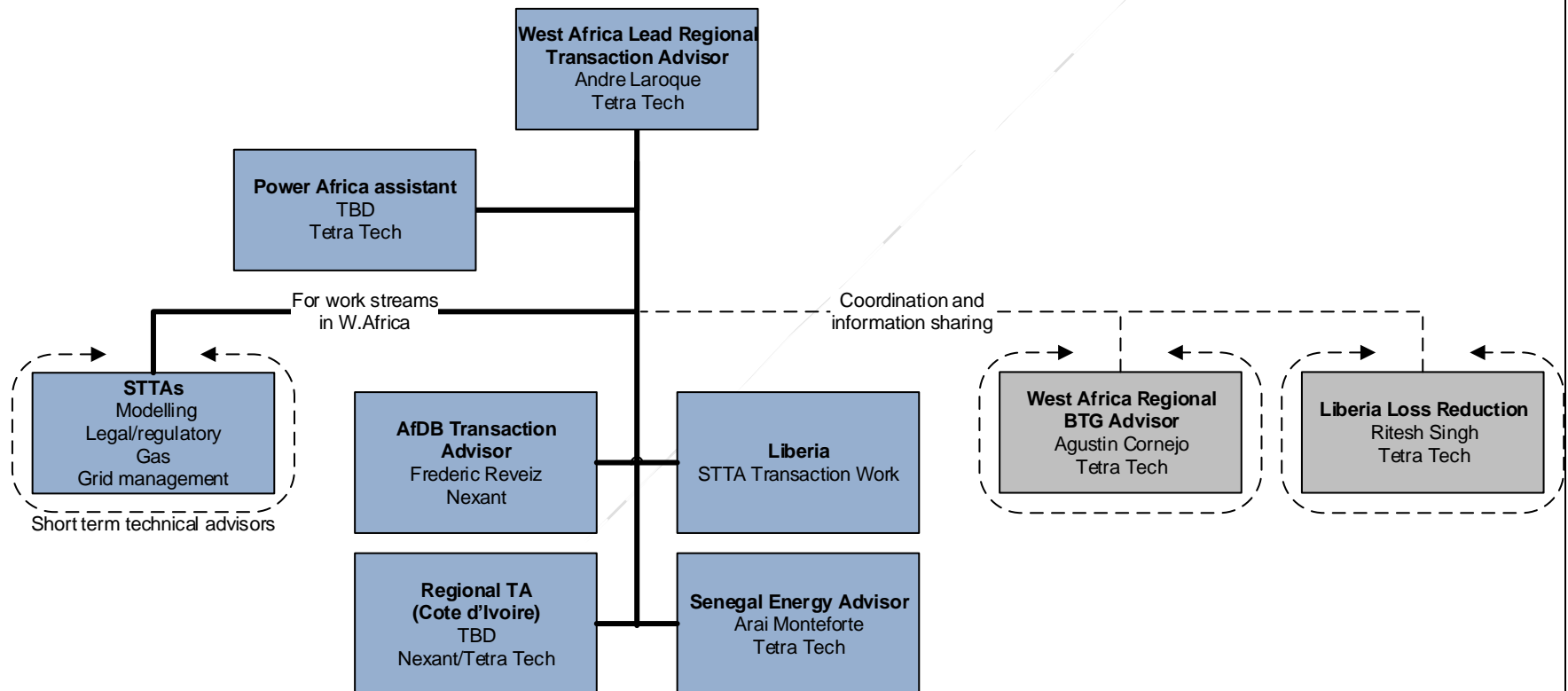


## POWER AFRICA ROADMAP PILLAR 3: UNLOCKING ENERGY SECTOR POTENTIAL

### **Technical Assistance to Regional Interconnection Projects**

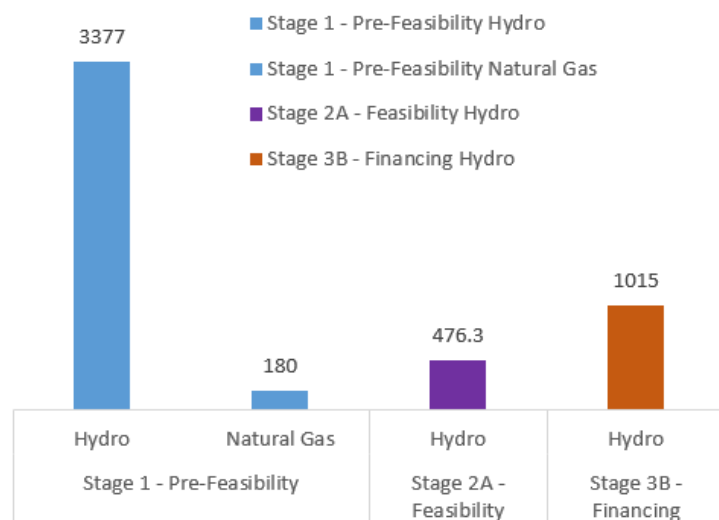
PATRP will support the relevant governments in developing the following cross-border power transmission projects: Niger-Burkina, Ghana-Burkina, Senegal-Gambia, and Cote d'Ivoire-Guinea. This assistance will include technical feasibility studies, financial modeling, and transaction support for required bilateral agreements. This work will be supported from Pretoria by the DCOP (Technical) and other short-term technical assistance, as needed.

## WEST AFRICA | STAFFING & ORGANIZATION





## WEST AFRICA | TRANSACTION DASHBOARD | TECHNOLOGY & STAGE



Name	Technology--Wind, Solar, etc.	MW
Stage 3B - Financing		
OMVS Manantali II	Hydro	500
Stage 2A - Feasibility		
Gran Kingkon	Hydro	291
Fello Sounga	Hydro	82
Digan	Hydro	93.3
Markala	Hydro	10
Stage 1 - Pre-Feasibility		
Tigeya	Hydro	60
Saltinho	Hydro	19
Gozoguezia	Hydro	48
Gaoual-C	Hydro	49
Fomi	Hydro	110
Fetore	Hydro	124
Fakarra	Hydro	70
Doundouko	Hydro	127
Diaragella	Hydro	72
Diaoya	Hydro	149
Boureya	Hydro	114
Bonkon Diara	Hydro	174
Bamafelle	Hydro	58
Balassa	Hydro	181
Amaria	Hydro	300
Hakkaounde	Hydro	84
Kassa B	Hydro	118
Korafindi	Hydro	100
Tourdou	Hydro	56
Tiopo 2	Hydro	83
Tiopo 1	Hydro	115
Tene	Hydro	76
Poudalde-	Hydro	130
Netere	Hydro	71
Morisananko	Hydro	100
Mangoy	Hydro	67
Madina Kouta	Hydro	67
Lafou	Hydro	98
Kouya	Hydro	86
Kouravel	Hydro	135
Koukoutamba	Hydro	292
Kogbedou	Hydro	44
Banda Gas-to-Power	Natural Gas	180

# 15. SENEGAL

Power Africa Transactions & Reforms Program | Senegal Portfolio 2016



## KEY TARGETS:

- Generation Capacity Pending Financial Closure; Unit MW
- Transactions Pending Financial Closure; Unit #


300

4

## DELIVERABLES:

Action plan for PATRP support for implementation of the rural electrification program (PNER)


## PLANNED ACTIVITIES:



**POWER AFRICA ROADMAP**  
**PILLAR 1: GETTING TO 30,000 MW**

**Continued Support from West Africa Lead Regional Transaction Advisor Based in Dakar**

PATRP will continue to provide transaction assistance to various stakeholders in the power sector through its resident West Africa Lead Regional Transaction Advisor. He will also backstop the government as it implements the new 200 MW Scaling Solar program with the IFC. In conjunction with this activity, he will also analyze bottlenecks in the existing procurement process for new generation and make recommendations on how to streamline the process for both tendered and unsolicited bids, which may call for the development of a one-stop shop for project development and implementation.



**POWER AFRICA ROADMAP**  
**PILLAR 2: GETTING TO 60 MILLION CONNECTIONS**

**Support Implementation of the Rural Electrification Program**

Building on the national rural electrification action plan (PASER) results and with the backing of Sustainable Energy for All (SE4All), Senegal is developing an ambitious rural electrification program (PNER) for the 2015-2025 period. The PNER aims to increase the rate of rural electrification (in terms of rural household connections) from 27% in 2015 to 100% in 2025. Within this framework, PATRP's West Africa Regional BTG advisor in coordination with the USAID/Senegal mission can participate in the Technical Partner Financiers committee. Proposed PATRP interventions to be validated in this committee include:

- Furthering mini-grid development. This may include technical assistance to specific projects, as well as improving the enabling environment for their development.
- On the six concessions awarded, support the Ministry of Energy in better understanding tariff differences among concessions in rural areas and analyzing more equitable options. Activities to be explored include estimating cost of service, establishing tariff setting procedures, analysis of targeted subsidies, capacity building, and community outreach.

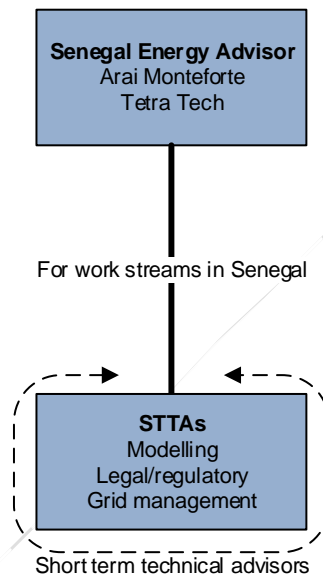


## POWER AFRICA ROADMAP PILLAR 3: UNLOCKING ENERGY SECTOR POTENTIAL

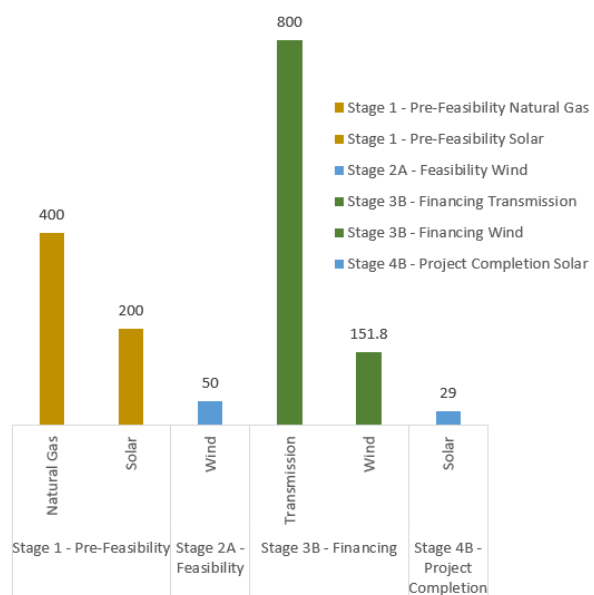
### **Other Activities**

PATRP has deployed a new French-speaking resident advisor to Senegal to support the Regional Transaction Advisor and to oversee the following new activities: (1) develop an energy demand model to inform transmission and distribution planning: PATRP plans to assist the regulator (CRSE) and state utility (Senelec), to revise their current demand forecast model and validate the various assumptions; (2) support the Ministry of Energy and Senelec to develop and implement an optimal energy mix strategy.

## SENEGAL | STAFFING & ORGANIZATION



## SENEGAL | TRANSACTION DASHBOARD | TECHNOLOGY & STAGE



Name	Technology-- Wind, Solar, etc.	MW
Stage 4B - Project Completion		
Senergy 1	Solar	29
Stage 3B - Financing		
Taiba N'Diaye	Wind	151.8
OMVG--Transmission	Transmission	800
Stage 2A - Feasibility		
Leona 50 MW	Wind	50
Stage 1 - Pre-Feasibility		
FSRU HFO with LNG	Natural Gas	400
Senegal Scaling Solar Program I	Solar	100
Senegal Scaling Solar Program II	Solar	100

# 16. LIBERIA

## Power Africa Transactions & Reforms Program | Liberia Portfolio 2016




### KEY TARGETS

▪ Generation Capacity Pending Financial Closure; Unit MW	121
▪ Transactions Pending Financial Closure; Unit #	3
▪ Training and Capacity Building Activities; Unit hours	100

### DELIVERABLES:

Final LEC Loss Reduction Report  
 Final RFQ for new LEC Management Contract  
 Draft RFP for new LEC Management Contract  
 Final RFP to operate and manage HFO Generation Assets

### PLANNED ACTIVITIES:




**POWER AFRICA ROADMAP**  
**PILLAR I: GETTING TO 30,000 MW**

**Pursuing New Generation Capacity**

A “Preliminary Assessment” completed by a PATRP team at the request of the Ministry of Lands, Mines, and Energy (MLM&E) identified 104 MW of Heavy Fuel Oil (HFO) power plant assets in-country and currently owned by a mining firm. The HFO plants are in two separate “packages”: (i) 78 MW - 10 X 7.8 MW plants: all 10 are still in crates and are being relocated to Buchanan; and (ii) 26 MW - 6 X 4.4 MW plants: five have been installed in the port city of Buchanan. PATRP will explore various options for utilizing these assets.

PATRP will also support additional generation projects as needed e.g. 17.5 MW biomass project.



**POWER AFRICA ROADMAP**  
**PILLAR 3: UNLOCKING ENERGY SECTOR POTENTIAL**

**Loss Reduction Program for the Liberia Electricity Corporation (LEC)**

PATRP will complete its existing LEC loss reduction program that will quantify technical and commercial losses and make recommendations for their reduction. PATRP is analyzing LEC’s technical and administrative functions by performing GIS mapping, metering, and management systems studies. PATRP will complete the Loss Reduction Study by submitting a final report and presenting it to USAID and High Level Steering Group (HLSG) by end of July/early August. As an immediate follow-on to the abovementioned loss reduction study, and to show proof of concept, PATRP will support LEC’s implementation – on a pilot basis if approved by the Mission Director – of a loss reduction plan targeting technical, financial and customer systems.

**Procurement of new LEC Management Contract**

The Government of Liberia (GOL), as part of its Compact with MCC, will transition to a new Management Services Contract (MSC). The objective of this workstream is to support the end-to-end process of designing a new MSC and the bidding, negotiation, and contracting process that will see LEC transition to a new

management contractor and provide support to GOL in defining and planning their oversight of the contract. PATRP will develop an investment and turnaround management action plan that will account for planned investments in the sector and be incorporated into the terms of the MSC.

Agreements on the investments with the donors and LEC board is a key element that will also affect the definition and establishment of key performance indicators in the MSC contract and define any financing gap that may be identified during the LEC power system planning stage. PATRP will organize workshops with LEC, relevant donors and other stakeholders, as identified by the government, in order to ensure buy-in on the proposed contract structure. PATRP will also work in close coordination with consultant(s) provided by the World Bank for the purposes of putting in place a program management unit at LEC.

In terms of timelines, the key milestones are as follows:

- PATRP will submit Request for Qualification (RfQ) for review towards mid-July and expects that RfQ will be released to market early August.
- PATRP will circulate the draft RFP and draft management services contract (MSC) agreement by the end of September.

# 17. ENVIRONMENTAL COMPLIANCE

As previously noted, in accordance with Condition 1 of the IEE, PATRP-supported transactions are subjected to a two-stage screening process in order to determine their risk to the community and the ways in which they may have a social and environmental impact.

Following identification of suitable transactions, a Preliminary Environmental and Social Review Methodology (PESRM) checklist is completed for PATRP supported transactions,<sup>2</sup> which serves as a monitoring, evaluation, and reporting tool throughout the planning phase of a particular transaction, prior to its implementation. Where relevant, remedial actions to be taken by PATRP in order to verify or promote environmental and social good practices are provided. The checklist is updated as a transaction moves through its stages until it reaches Financial Close. Condition 3 of the IEE requires that Environmental and Social Impact Assessment (ESIA) Reports completed by third parties are reviewed for all PATRP-supported transactions and by no later than Stage 4 (of a transaction's progress). The review includes an evaluation of whether a transaction demonstrates adequate environmental and social compliance, and also whether the ESIA Report is of an acceptable standard to allow such determinations to be made by PATRP. This is done by confirming in the PESRM Checklist that the ESIA report meets minimum reporting requirements for ESIA in accordance with IFC requirements. In cases where the ESIA is found to be deficient, the developer/partner is requested to provide further supplementary information, or in more severe cases it is recommended that the ESIA process be revisited.

## Checklists and ESIA Reports

As of January 1, 2016, there were more than 150 PATRP-supported transactions with a total of 102 transactions subjected to the PESRM checklist, split among the following stages:

- Stage 1 – 48 transactions
- Stage 2 – 21 transactions
- Stage 3 – 31 transactions
- Stage 4 – 2 transactions

For the majority of Stage 1 and 2 transactions, a review of pre-feasibility information is required to further progress the transaction to later stages. ESIA Reports for PATRP transactions at Stage 2 and above will be sourced, and in cases where ESIA reports are not made available by partners for contractual reasons, Environmental Authorizations will be obtained. In instances where deficiencies in ESIA reports are noted (e.g. poor or inaccurate environmental baseline descriptions, lack of adequate public consultation or suitable mitigation planning), PATRP will provide recommended remedial actions and will conduct further due diligence to ensure that recommendations are implemented by developer/sponsors. Previous recommendations have typically ranged from requesting the supply of supplementary information, to revisiting the ESIA process. Instances where practical Power Africa assistance is possible have also been highlighted. PATRP's Environmental and Social (E&S) Specialist maintains a system for monitoring what actions are being taken by the relevant parties to address the recommendations made in the PESRM Checklists.

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<sup>2</sup> In accordance with PATRP Standard Operating Procedures, for USG-Supported Transactions directly involving one or more USG agencies, International Financial Institutions (IFIs) or Multilateral Development Banks (MDBs), this requirement will be satisfied by confirming that the applicable USG agency, IFI or MDB is conducting environmental and social impact screening using its own policies and procedures.



Going forward, PATRP will continue efforts to source ESIA reports and subject all qualifying PATRP transactions to the PESRM checklist process for each stage of the transaction life, to determine whether continued support is warranted based on environmental and social factors. This process will also serve to identify whether any additional advisory support within the context of PATRP involvement on a particular transaction can be provided to ensure application of socio-environmental best practices. Several early-stage transactions (large hydropower transactions, in particular) do warrant ongoing PATRP monitoring or more affirmative activities due to siting considerations and associated impacts on biodiversity and receiving communities. Attempts to source ESIA Reports for non-PATRP transactions (not required to be screened by PATRP) will also be made.

### **Training**

Condition 6 of the IEE requires training to promote environmental and social soundness within PATRP. PATRP has taken steps to build the capacity of the transaction advisors to integrate environmental and social aspects into their activities at the country and transaction level. Through internal capacity building, facilitated by the E&S Specialist, PATRP ensures that its transaction advisors understand the environmental and social issues of their respective transactions.

PATRP has developed two training modules covering content and conditions of the IEE as well as PATRP's position for addressing environmental and social issues within the scope of the contract. The training provides background on best practices and impacts and standard mitigation for specific generation technologies. In this context, the training will be rolled-out to PATRP Pretoria staff and via webinar to transaction advisors in February 2016. Thereafter, PATRP will keep the E&S training modules updated and provide refresher training (with a particular focus on new transaction advisors). Future training modules will also incorporate the following elements/considerations:

- Collaboration with the USAID / Coordinator's office to identify relevant issues, including the Executive Order on Climate Change and Development; and,
- Inclusion of further case studies or experiences of TAs to expand the knowledge base.

### **Advisory Support**

The PATRP E&S Specialist provides E&S advisory support to transaction advisors and partners in line with Condition 7 of the IEE.

- PATRP will proactively provide technical assistance to the development of Environmental and Social Management System and Stakeholder Engagement Plan following IFC guidelines in support of developer/sponsors application for OPIC and other DFIs as needed.
- Ad hoc reviews of ESIA reports to determine whether they have been conducted in accordance with international standards, which is required by Multilateral Development Banks in application for funding/support.

The E&S Specialist will remain available to provide ad hoc E&S support to transaction advisors and partners, and is supported by the PATRP Gender Advisor who can provide support on gender-specific issues.

# 18. GENDER INTEGRATION

PATRP has on staff a Gender Advisor who serves as a resource to all PATRP staff; helping staff to identify entry points for gender integration within their specific spheres of influence. While the Gender Advisor serves as a resource, it is understood that gender integration is an issue for all staff to address to the extent possible within their scopes of work. The nature of those activities is defined as opportunities arise, and is informed by the objectives of both the Power Africa and PATRP gender integration strategies. The Gender Advisor's responsibilities include reviewing key PATRP documents such as work plans and work orders and country level technical policy and regulatory frameworks to ensure the inclusion of gender components, where relevant.

The Gender Advisor will also support information sharing with, and capacity building of, PATRP staff. Given that the transaction advisors and the policy and regulatory teams are providing technical support at the country and/or regional level, they are best placed to integrate gender in the context of PATRP's support. In order to do so, they need to be equipped with an understanding of relevant concepts and information on gender and energy. The Gender Advisor will continue to share relevant information on an ongoing basis and will maintain the internal electronic library of resources on gender and energy. The Gender Advisor will continue to review the transactions advisors' weekly reports, and when possibilities to consider gender in their activities are identified, the appropriate support and guidance will be provided. As such, PATRP transaction advisors will remain mindful of the importance of considering gender in their projects, especially amidst competing priorities.

In addition, the Gender Advisor will provide technical guidance and implementation strategies for country-level energy sector regulatory, legal and policy frameworks that will lead to an improved enabling environment for women's empowerment and the advancement of gender equality in the energy sector. The type of guidance provided will depend on the policy intervention and the nature of PATRP's support. Examples include identifying and sharing existing good practices with partners and government entities, integrating a gender component into consultative processes around energy sector reform, and undertaking gender analysis to ensure policy, legislative, or regulatory reform is evidence-based and designed to meet the energy needs of men and women.

PATRP's gender advisor will continue to support the Coordinator's Office to facilitate the Women in African Power (WIAP) network. This includes maintaining the WIAP network database and co-managing the LinkedIn group, responding to requests for female experts from within the network for speaking engagements at major energy conferences, and supporting the planning of network events.

Upon request from the Coordinator's Office, PATRP will provide support to the Young African Leaders Initiative (YALI) First Energy Institute in June at the University of California – Davis. PATRP's Gender Advisor, in collaboration with a USAID-contracted external expert, will develop course material for two half-day sessions on gender and energy. The material will be presented at UC-Davis by the PATRP Gender Advisor. A report will be drafted outlining how Power Africa can incorporate the gender training into an African university setting.

In addition to the activities ensuring gender integration into the work undertaken by PATRP staff, PATRP will also remain committed to gender diversity within its team structure. Where new staffing needs are identified, PATRP will take steps to broaden the recruitment pool to include female candidates. Vacancies will be circulated within the Women in African Power (WIAP) network, for example. PATRP remains mindful of its obligation to promote women's participation in the energy sector, including and especially within PATRP.

# APPENDIX A: PERFORMANCE INDICATORS

Indicator Name	FY 2016 Targets
Number of new grid and off-grid projected direct connections ; Unit #	300
Number of inferred connections from new generation ; Unit #	1,195,647
Generation Capacity Pending Financial Closure (ON GRID); Unit MW	19,273
Transactions Pending Financial Closure; Unit #	121
Generation Capacity Reached Financial Closure (ON GRID); Unit MW	1,566
Transactions Reached Financial Closure; Unit #	9
Training and Capacity Building Activities; Unit hours	3,612
Policy; Unit # (drafted)	15
Kilometers of Power Lines pending Financial Close; Unit KM	9,103
Kilometers of Power Lines that have reached Financial Close; Unit KM	263
Substation Capacity Added; Unit MVA	150
Wheeling Capacity; Unit MW	600
Aggregate Losses for three distribution companies average	7%
Transmission Projects that are pending Financial Close; Unit #	7
Transmission Projects that have reached Financial Close; Unit #	2